

3. PROJECT DESCRIPTION AND ALTERNATIVES

3.1 PROJECT LOCATION AND OVERVIEW OF THE PROPOSED PROJECT ALTERNATIVES

The proposed Green Line is located entirely within the city of Seattle, Washington. The project would serve some of the highest-density population and employment areas of the state of Washington. To assist in evaluating reasonable alternatives for the Green Line, analysis in this Draft EIS is divided into six geographic segments, organized from north to south (Figure 3-1):

Segment 1: Ballard - From NW 85th Street to south of the Lake Washington Ship Canal.

Segment 2: Interbay/Magnolia - South of the Lake Washington Ship Canal to W Harrison Street.

Segment 3: Queen Anne/Seattle Center/Belltown - From W Harrison Street in southwest Queen Anne to the Seattle Center area and along Fifth Avenue in Belltown to Lenora Street.

Segment 4: Downtown/Pioneer Square - From Lenora Street through Downtown Seattle and Pioneer Square to King Street Station.

Segment 5: South Downtown (SODO)/Chinatown International District/Pioneer Square - From King Street Station in Pioneer Square through the SODO area to S Horton Street.

Segment 6: West Seattle - From State Route (SR) 99 to the Alaska Way Junction and then along California Avenue SW to the Morgan Junction.

Within each segment, the EIS analyzes a number of alternatives for alignments, stations, and other facilities based on scoping comments and the results of initial design, engineering, and operational studies. The EIS also evaluates a No Action Alternative, to which other alternatives are compared. Common features of the alternatives are discussed in Sections 3.3 and 3.4 of this Final EIS. Conceptual designs for the alternatives examined are available in the Draft EIS Volume 2, Appendix L, and updated conceptual designs for the alternatives evaluated in the Final EIS are provided in Appendix LL. Key characteristics of all alternatives include:

- **Alignment Alternatives:** All of the Green Line alternatives (except the No Action Alternative) feature elevated guideways primarily along existing street rights-of-way, consistent with the Green Line route description in the Seattle Popular Monorail Plan. The alignment alternatives studied in this EIS provide a basis for evaluating decisions about locating the guideway and its support columns along existing streets. The alternatives also provide a basis for evaluating impacts related to guideway height, and whether dual guideways would run parallel with each other (horizontally arranged), at different levels (vertically arranged), or if some portions of the alignment would involve a single guideway beam. The description of alternatives also defines the location of the guideways in relation to curves, turns, slopes, intersections, and buildings. There are also additional options related to the placement of switches and traction power substations. Included in the discussion of alignment alternatives is detailed analysis of the two potential locations for a Green Line Operations Center, as well as the common features and facilities – including guideway beams, support columns, bridges and special structures, traction power substations, and switches – that the Green Line will use along its alignment.

**Figure 3-1
Seattle Monorail Project
Green Line Corridor
Project Area**

Alternatives By Segment

Segment 1: Ballard

- 1.1 - West Side of 15th
- 1.1(s) - West Side of 15th with Single Beam
- 1.2 - Center of 15th/East Bridge

Segment 2: Interbay

- 2.1 - West Side of 15th/Center of Elliott
- 2.1(s) - West Side of 15th/Center of Elliott with Single Beam
- 2.2 - Center of 15th/West Side of Elliott

Segment 3: Queen Anne/Seattle Center/Belltown

- 3.1 - Seattle Center/Republican
- 3.2 - Mercer
- 3.3 - Thomas
- 3.5 - Second/Denny

Segment 4: Downtown

- 4.1 - West Side of Second
- 4.2 - East Side of Second with Crossover
- 4.3 - Center of Second
- 4.4 - East Center of Second

Segment 5: SODO

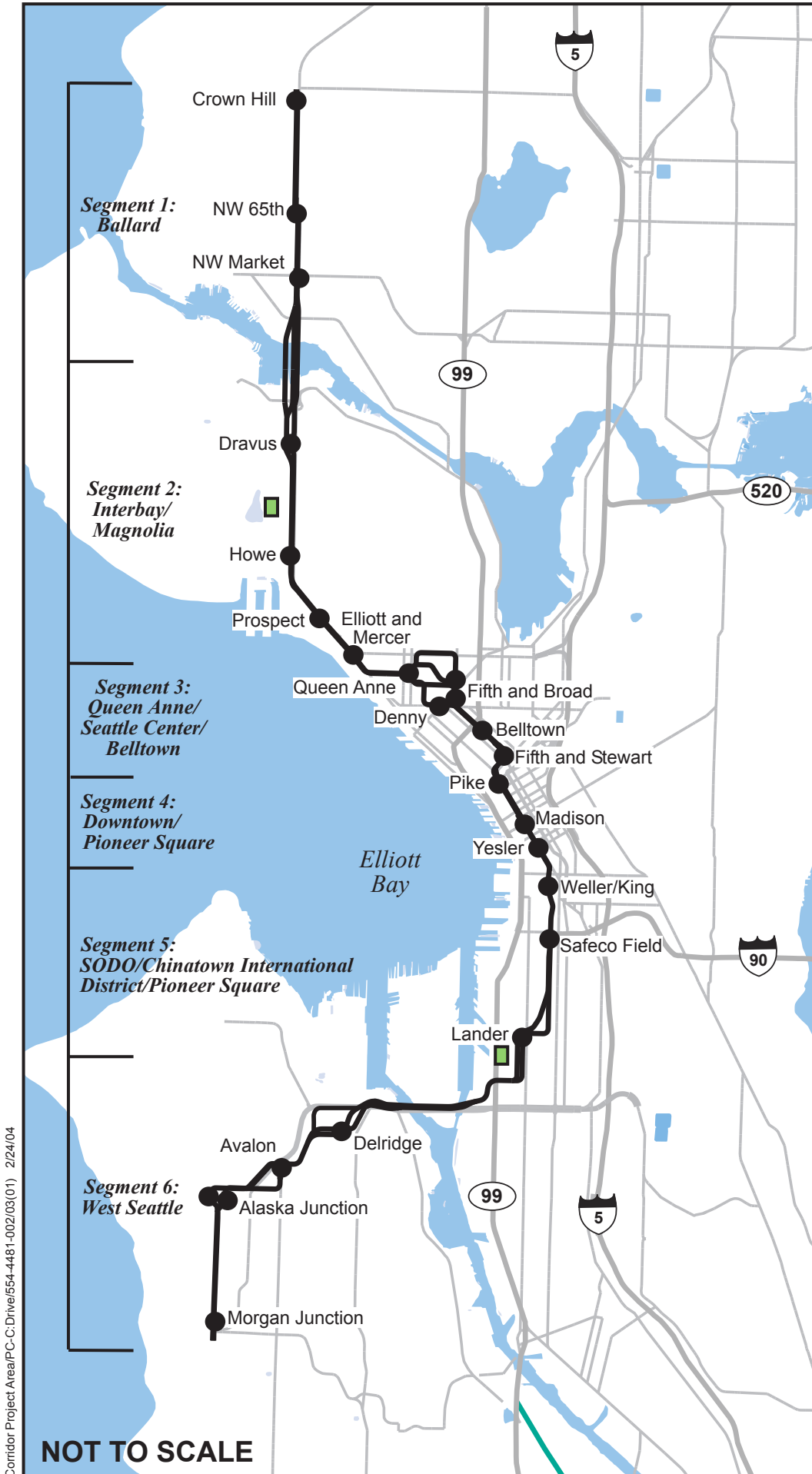
- 5.1 - East side of Third/Utah
- 5.2(s) - West Side of Third/Utah with Single Beam
- 5.2 - West side of Third/Utah

Segment 6: West Seattle

- 6.1 - West Seattle I
- 6.2 - West Seattle II
- 6.3(s) - Delridge North with Single Beam
- 6.4 - West Seattle Andover/Yancy Subsegment
- 6.4(s) - Andover/Yancy with Single Beam
- 6.5 - Genesee Subsegment

Note: Segment Preferred Alternatives are illustrated in Figures 3-32 through 3-36

- Station Vicinities
- Operations Center Alternatives



NOT TO SCALE

- **Station Alternatives:** The station alternatives evaluated in this EIS were developed from the general station vicinities described in the Seattle Popular Monorail Plan. The alternatives examined in the Green Line EIS provide more detail on specific site and design choices, considering factors such as ridership, potential costs, operational and engineering needs, potential environmental impacts, and scoping comments. The EIS station alternatives include a number of basic types of stations: center platform, center platform with mezzanine, side platform, side platform with mezzanine, vertical, elevator, event/turnback, and terminus. The EIS station alternatives describe the station types and locations in relation to existing streets and properties and provide overall parameters to be used in evaluating the environmental impacts of a variety of size, height, platform, and guideway configurations, as well as expected access, circulation, and operational design approaches, including bus facilities. The station alternatives evaluated in this EIS are not specific station designs, but are conceptual designs that establish conservative assumptions for the EIS review of potential impacts. Actual station designs will be developed during and after the EIS process and will incorporate extensive input from the public. Design criteria developed during the EIS process will also inform station design, as will community goals and desires that were expressed through comments on this EIS and as part of SMP's community involvement process. It is possible that future projects may be developed on remainder parcels at station locations. No such projects are proposed at this time, and any such future project would undergo separate environmental review as needed. See Appendix QQ for more information.

The ultimate detailed design of Green Line stations and guideways will be key to the Green Line's fit and function within individual neighborhoods. SMP has also initiated an extensive community consultation process around station and guideway design, with a coordinated approach to achieve overall system design objectives, integrated with the work of urban design teams focusing on design and environmental issues in the communities through which the Green Line will pass. Community consultation around design began in mid-2003, and is anticipated to continue through permitting and construction, with attention given to special study areas, including neighborhood business districts, Seattle Center, and Downtown/Pioneer Square.

The following sections describe the No Action Alternative, followed by the alignment and station alternatives being considered within each segment. Although the segment alternatives consist of individual alignment and station choices that are generally interchangeable within and between each given segment, they have been assembled for ease of analysis and discussion of impacts at the segment and full project level. For ease of public review, the Final EIS repeats or updates the description of alternatives, except in cases such as the Operations Center and other operational or generic features of the alternatives that have not been updated since the publication of the Draft EIS.

3.1.1 Projected Ridership

The Seattle Popular Monorail Plan projected average daily Green Line ridership of 69,000 in 2020. This average was based on the fact that Green Line ridership is projected to range from 47,000 to 50,000 trips on an average weekday in 2020, with an additional 6,000 to 12,000 trips predicted for event days. During periods of high tourism, up to 5,000 additional riders would also be expected to use the system each day (*Ridership Forecasting Report*, URS Corporation, July 2002).

3.1.2 Request for Proposals (RFP) Procurement Process

SMP is also working on the procurement process that will select a contractor team to design, build, operate, and maintain the Green Line. SMP selected a Design-Build-Operate-Maintain (DBOM) approach in December 2002 after reviewing the experience of other complex infrastructure projects locally and around the country that have successfully used this contracting approach. The DBOM

approach offers the benefits of both early cost certainty – because contractor teams submit fixed-price bids to design and build the entire Project – and Project integration, because design, construction, and ultimate operations are managed by a single Project team.

In mid-2003, SMP identified two teams, Cascadia Monorail Company and Team Monorail, as qualified to submit specific proposals. The procurement process continued with the release of a Draft Request for Proposals issued for industry and public review in December 2003, and a Final Request for Proposals in early 2004. Because the two competing teams use different monorail technologies with different cars, guideway beams, switches, and other components, the selection process will be completed before final design work is completed on the Green Line's alignment and station locations. Where these technologies have different environmental impacts, this EIS has conservatively estimated impacts using the technology with the largest impact. The DBOM contractor will be responsible for implementing the mitigation measures outlined in Chapter 5, Mitigation Program.

3.2 COMMON FEATURES AND FACILITIES OF THE ALIGNMENT ALTERNATIVES

After identifying the Green Line corridor in late 2001 as the first corridor for a monorail line to be developed, the ETC developed a number of planning criteria against which alternative route options along the Green Line could be evaluated. These criteria were discussed in the Draft EIS on pages 3-4 through 3-5 and remain unchanged for the Final EIS.

A number of components—including guideway beams, support columns, and special structures—would be required as the Green Line is constructed. These components, and the conditions that would guide their use, are shown in Figures 3-2a and 3-2b and described in the paragraphs below. Operational facilities, including switches, storage tracks, and a “downtown turnback” configuration are described in Section 3.6.9.

3.2.1 Monorail Guideway

The Green Line would travel on one to two guideways supported by columns and other structures. A guideway is a rectangular beam on which the monorail trains would ride, with the trains guided by rubber tires against the beam. The trains on the guideway may have a different configuration depending on the vendor selected to supply the train cars, and that train cars may be designed, painted, or otherwise outfitted in different ways. The guideways would also house other systems elements, such as the electrical transmission components needed to power the trains and the walkways needed to unload passengers in the event of an emergency. When dual guideways are used, the beams must be located far enough apart to allow two trains traveling in opposite directions to pass.

A number of comments to the Draft EIS asked for additional information regarding the monorail train's “dynamic envelope” and what that would mean for potential repairs and maintenance of buildings along the Green Line route. The train's dynamic envelope is the furthest area in which the monorail train would ever be located even under worst case conditions. Under normal operating conditions, the monorail train would travel along its normal “static envelope” or normal operating envelope. Under extreme conditions, however, the train could vary from this normal operating condition and be located closer to the property line and building façade. This limit on where the train would ever be located along the guideway, even under the most extreme conditions, is called the “dynamic envelope.” The minimum, specified distance from the dynamic envelope to property lines or building facades would be five feet under current specifications, which have been recommended by the Fire and Life Safety Committee (composed of SMP systems and facilities engineers and experts from Washington Department of Transportation and the City of Seattle Fire, Police, Transportation, DPD, and other departments) as a design minimum clearance. This

Dynamic Envelope

Lot Line

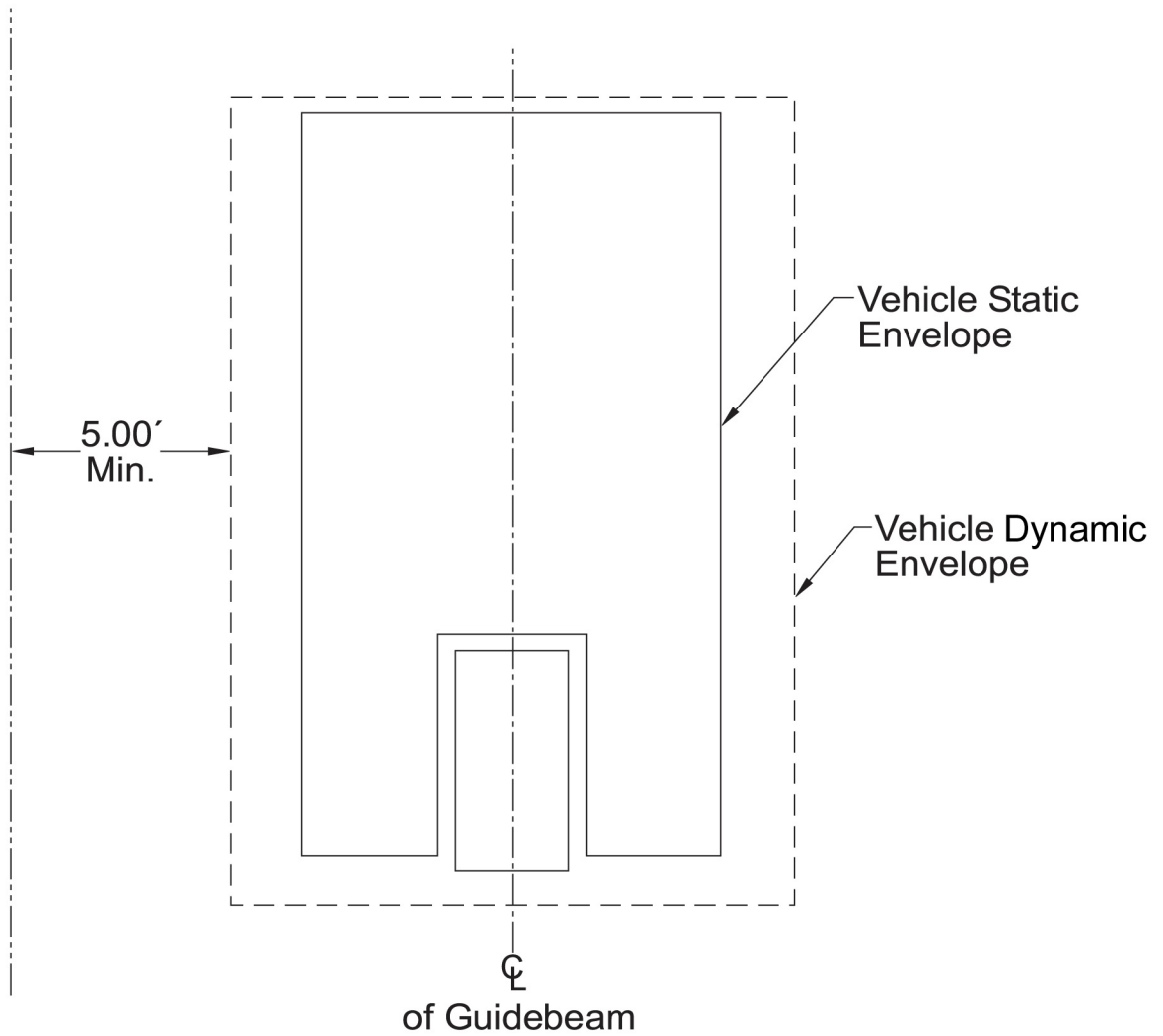
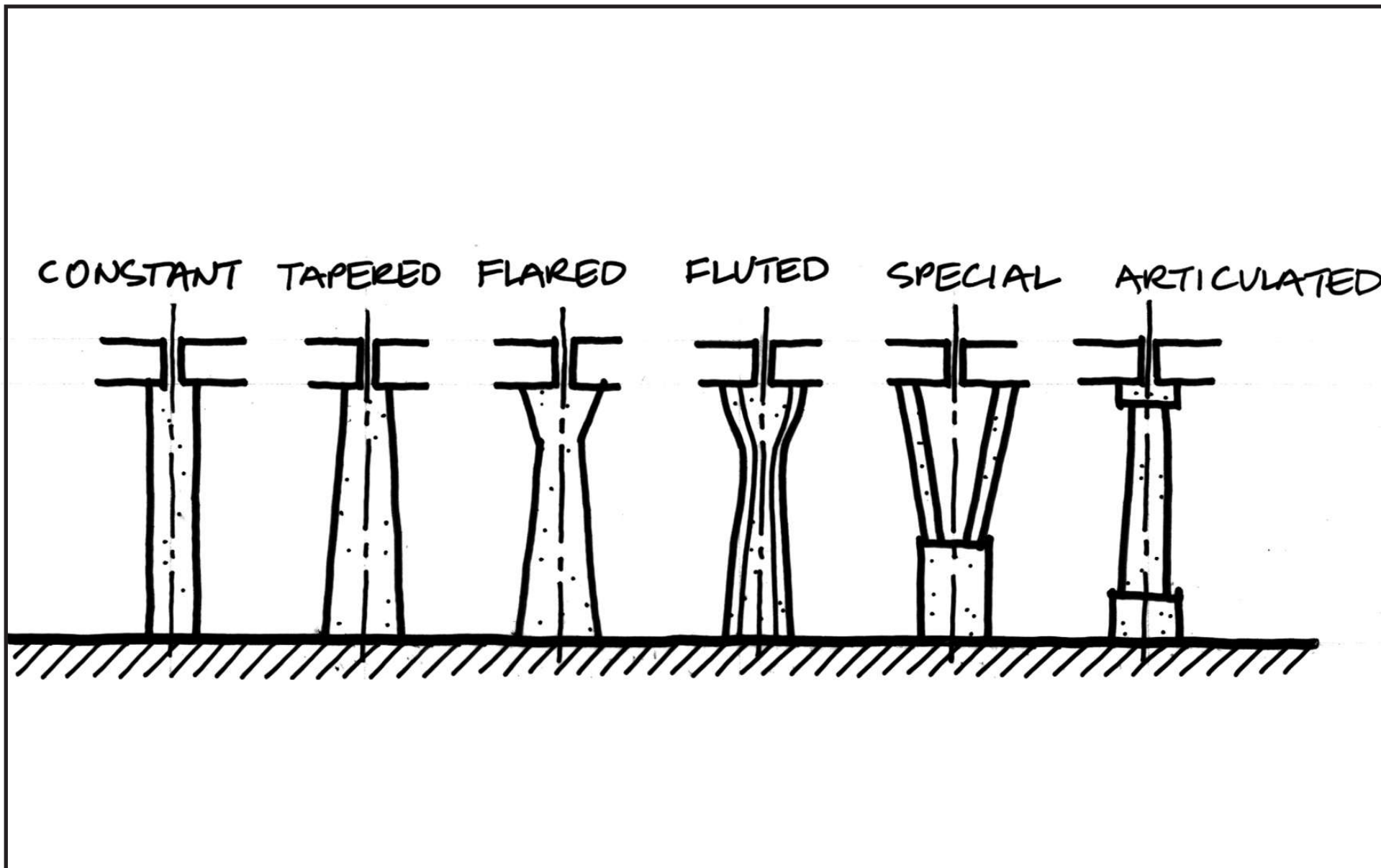


Figure 3-2a
Dynamic Envelope



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would occur in the 12 to 14-foot area along which the monorail train would pass the building, not for the entire building height.

All buildings along the line would still be able to wash windows and maintain their buildings. All common window washing equipment would be able to operate within the five-foot distance, including ladder work (under 30 feet), rope harnesses, or buckets. For more involved maintenance, such as tuck pointing older brick buildings, typical scaffolding systems are only three to four feet wide and many common scaffolding systems are even narrower. Even with a small space between the scaffolding and the building, it is easily feasible to work within the area of five feet from the building. A recent example of this is the Fisher Building, which was constructed adjacent to the existing Seattle Center monorail at the southwest corner of Fifth Avenue N and N John Street. That building was constructed even closer to the dynamic envelope of the existing monorail trains than the minimum distances proposed from building facades to the Green Line monorail trains. The building was successfully constructed, and is currently being successfully cleaned and maintained. A letter from Fisher Media Services Company, attesting to this, is included in Appendix MM.

Commenters also wanted to know how far from buildings that static envelope, or normal operating location, would be located. This would depend on the train manufacturer selected because the taller and wider trains have greater differences between their static envelope to their dynamic envelope. Generally, however, the minimum distance to a train would be six to six and one-half feet from the property line or façade. Readers should note that, for a given column location, it is possible to move guidebeams slightly further from buildings by offsetting the guidebeams with respect to the foundation beams. The tradeoff for offset guidebeams (also called eccentric columns) is larger foundation beams in the sidewalk or right-of-way. Another method to locate trains further from buildings could be by using the single beam configuration, which is SMP's Preferred Alternative in the lower-scale areas of Ballard and along California Avenue SW in West Seattle. More information about the dynamic envelope with respect to Downtown can be found in Section 4.1, Transportation, and Section 4.3, Land Use and Neighborhoods. For information about the dynamic envelope and historic buildings, please see Section 4.11, Cultural Resources. For an illustration of a train's dynamic envelope, please see Figure 3-2a.

3.2.1.1 Guideway Height

The guideway must be located high enough to provide adequate clearance over roads for vehicles in the street right-of-way and over other structures or facilities it would cross. The height of the guideway from the ground would vary in different locations, depending on topography, the need to maintain consistent grades, and other factors, such as the need for switches and stations to be level, but is anticipated to be based on the minimum clearance needed for vehicles in the roadway below. In some locations, where the guideway crosses over roadways or for bridges, the guideway would be higher. This could also occur where topography varies. SMP and the City of Seattle Department of Transportation are working together to determine the most appropriate height for street crossings. A minimum of 18 feet is likely in most locations, but could be higher. Clearance requirements will consider such factors as typical transportation use of the street, roadway maintenance and improvement needs, and topography.

3.2.1.2 Guideway Beam Arrangement

SMP has developed several options for arranging the guideways, including single beam arrangements, dual beam horizontal arrangements, and dual beam vertical arrangements. A dual arrangement of monorail guideway beams can be arranged horizontally or vertically. Examples of single, horizontal and vertical arrangements are provided in Figure 3-3 and briefly described below

- **Horizontal beam arrangement.** When dual guideway beams are arranged horizontally, the centers of the guideway beams would be on the same level and about 12 to 14 feet apart. At side platform stations, the horizontally arranged guideway beams would remain about 12 to 14 feet apart, with passenger platforms on the outsides. With a center platform station, the beams would diverge to a distance of approximately 37 feet between beam centers.
- **Vertical beam arrangement with Iris Structure.** With this configuration, dual guideway beams would be staggered about 12 feet apart vertically while maintaining a 12 to 14 foot horizontal separation. The Iris Structure is considered a design option in this EIS in a number of alignment alternatives (see Figure 3-3). Dual guideway beams can transition between vertical and horizontal configurations between stations if this type of configuration is desired for aesthetic or other reasons.
- **Single beam arrangement.** The monorail guideway can consist of a single beam with additional operational systems to serve train travel in both directions. Holding tracks and a computer-controlled switch, usually located near a station, would allow the trains to pass each other. A single beam arrangement can allow guideway structures, including columns, to be smaller than with a dual beam configuration, although it would increase the number of switches required, generally locating them near station areas. SMP has evaluated the feasibility of the potential use of a single beam arrangement in a number of areas along the Green Line route. These alternative guideway configurations are described in more detail later in this chapter. Background information about the single beam arrangement can be found in Appendix LL to this Final EIS. In general, a single beam configuration was considered most feasible in areas where the use of a single beam would still allow enough train frequency for ridership demand to be met and where the topography is level enough to permit the use of switches to facilitate the transition between a single beam and dual beam configuration.

Single beam configurations have been evaluated in this Final EIS in the following locations:

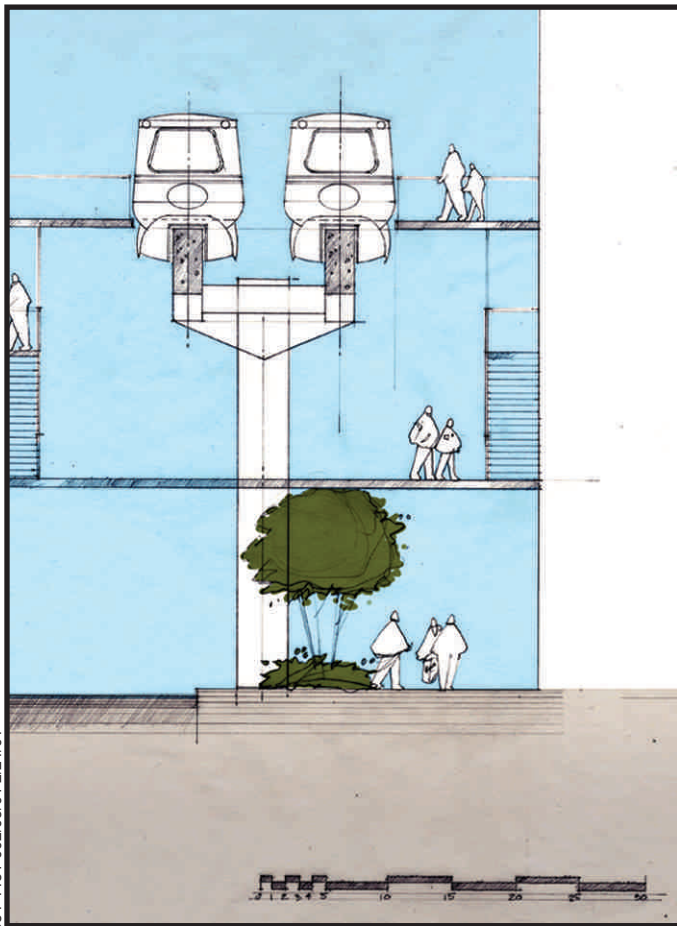
Ballard, Alternative 1.1(s)	Along 15 th Avenue NW, from Crown Hill to NW Market
Ballard Crossing, Alternative 1.1.1(s)	West Bridge Alternative with single beam
Interbay, Alternative 2.1(s)	West side of 15 th Avenue W, Center of Elliott
SODO, Alternative 5.2(s)	West side of Third/Utah
Duwamish Crossing, Alternative 6.1(s)	Over center of West Seattle Bridge
Delridge Area, Alternative 6.3(s)	North of Nucor Steel Plant along SW Spokane Street
Delridge Area, Alternative 6.4(s)	Andover/Yancy alignment with no station
California Avenue SW, Alt 6.1.6(s)	West side of California Avenue SW

These single beam alternatives are discussed in more detail below and are analyzed in detail in Chapter 4 of this Final EIS. Single beam arrangements in several of these areas have been selected as part of the Preferred Alternative presented in this Final EIS.

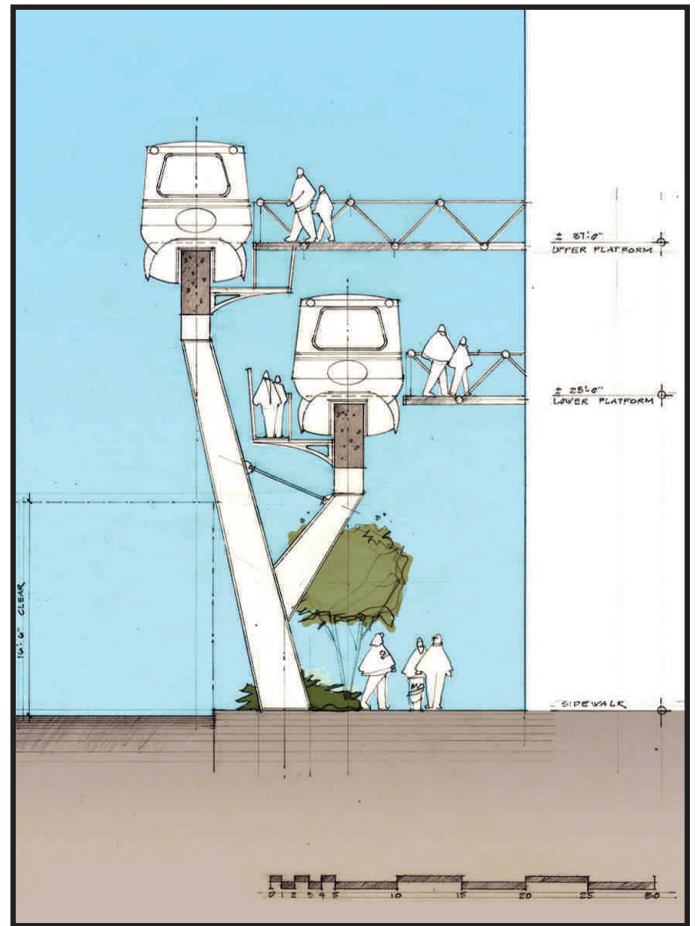
3.2.1.3 Special Guideway Configurations

- **Tail Tracks.** Tail tracks are single guideway beams that would extend beyond the end of the line for up to several hundred feet to store trains so as to provide maximum operating flexibility for the monorail system. Tail tracks are not required, but are evaluated with several of the alternatives for the Crown Hill and Morgan Junction stations.

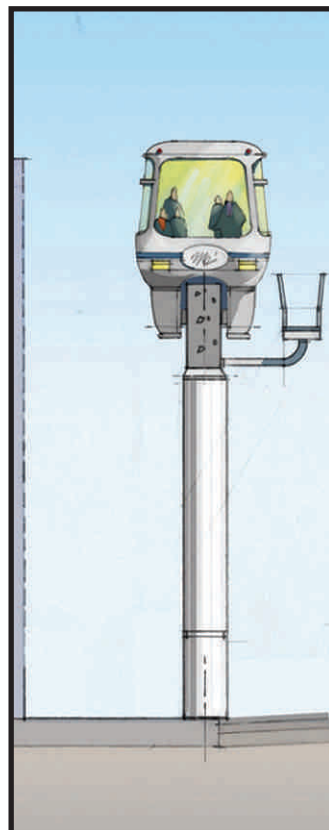
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Horizontally Arranged Guideways



Vertically Arranged Guideways



Single Beam Guideway

**Figure 3-3
Possible Guideway
Arrangements**

- **Pocket Tracks.** Pocket tracks are located between or beside two guideway beams, usually near a station, to hold trains temporarily during off-peak periods. Pocket tracks would be particularly likely near event stations to store trains in wait for the end of an event. Pocket tracks are typically 300 to 400 feet long so that they can hold two trains, but can be other lengths.

3.2.2 Support Columns

In most areas of the Green Line's alignment, the guideway beams would be supported by columns underneath single or between dual guideway beams. The size of typical support columns would be determined by geotechnical and seismic engineering requirements, as well as by the architectural form that is chosen. Please see Figure 3-4 for a representation of different types of columns. Although the basic size of a support column is determined by engineering requirements, columns may be able to be constructed out of different materials and in different shapes. Columns supporting special structures, such as bridges, will need to be larger, while those supporting a single beam configuration could be smaller. Typical support columns would range from three to 12 feet in diameter, depending on a number of factors, including geotechnical conditions, the height of the guideway, the configuration of the guideway beams (single beam configurations will permit smaller columns, while offset or eccentrically loaded dual beam configurations will require larger columns), and the length of the span between columns. The location of the specific columns would vary, as determined by engineering and site-specific considerations. However, where the location of columns is known, any property impacts or major changes in street or sidewalk layouts are also discussed.

3.2.2.1 Special Column Types

Special support structures—such as offset or eccentric columns or bent structures—could be used to support the guideway beams when long clear spans, curves, or cantilevered support systems are required, such as when the guideway curves or passes diagonally across a street or intersection. A bent structure (or straddle bent) consists of two columns supporting a girder approximately perpendicular to the guideway beams, with the girder usually straddling an entire street width. Other elevated transit systems that use bent structures have support columns on these structures ranging from three to four feet in diameter. A diagram of a bent structure is shown in Figure 3-4.

3.2.2.2 Column Location

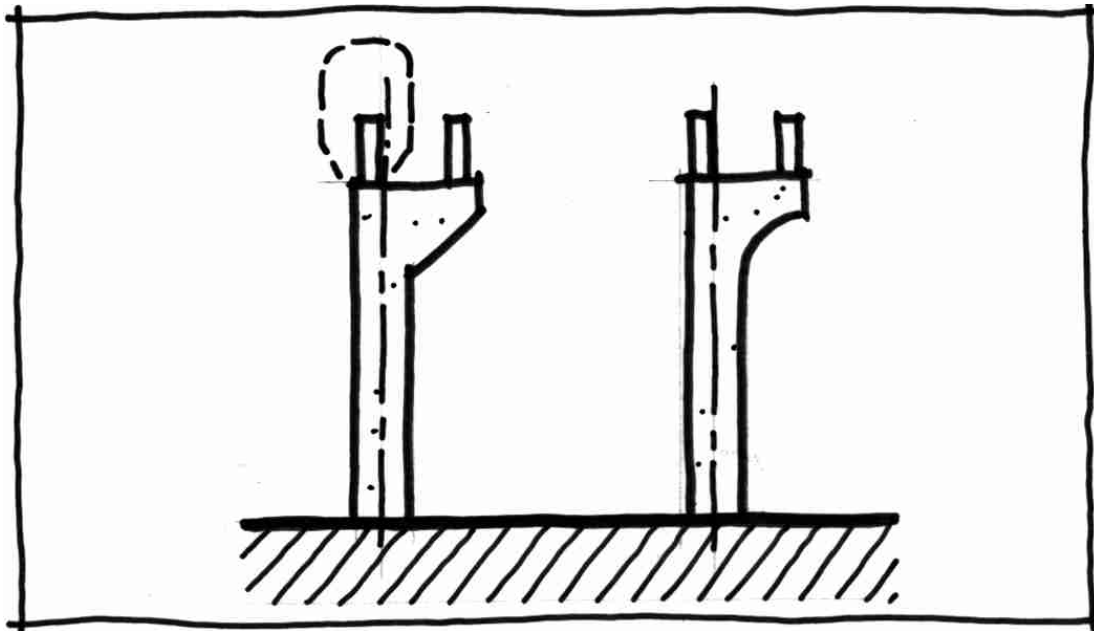
Guideway columns can typically be located from 60 to 150 feet apart without requiring special structures. Column locations may be varied within this range because of soil or seismic conditions, to minimize impacts on property, utilities, or transportation facilities, to accommodate sightlines, sidewalk widths, or a streetscape's architectural form, or to avoid being placed in front of a loading dock or building entrance.

3.2.2.3 Column Foundations

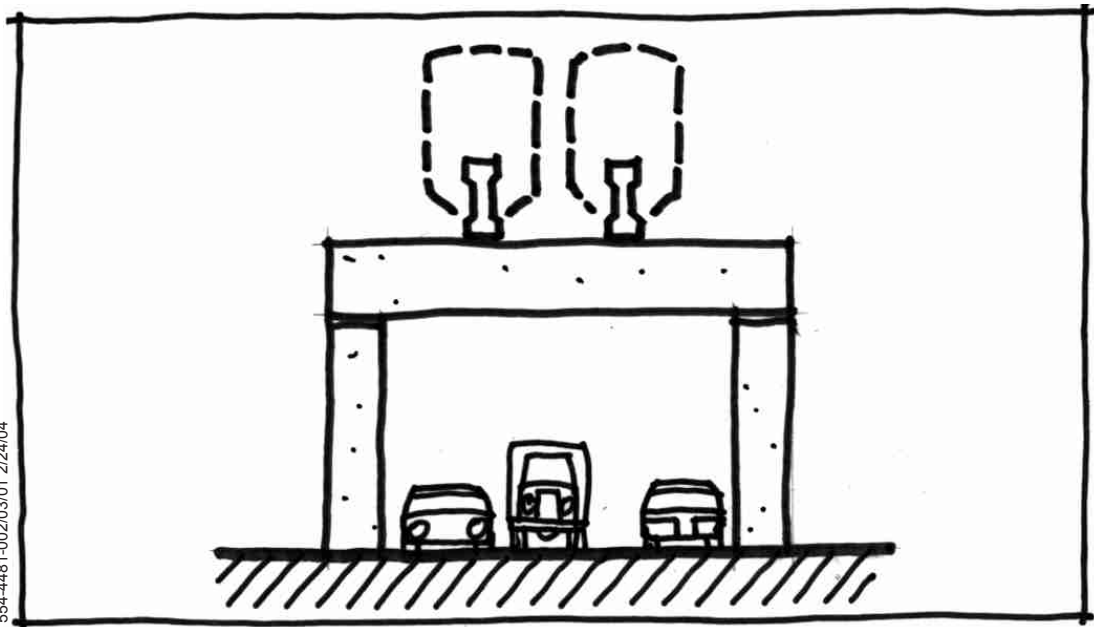
Monorail columns will have strong, deep foundations to support their height and weight and to tolerate the dynamic forces that occur during train operations.

3.2.3 Operations Center

Two alternatives for a Green Line Operations Center are evaluated in this EIS, one in the Interbay Segment and the other in the SODO Segment. Both alternatives would require switches for Green Line vehicles to enter and exit the Operations Center. Two switches would provide maximum flexibility for Green Line vehicles to access the Operations Center from either direction without affecting service on the main guideway. These switches would be the same as those described on page 3-42 of the Draft EIS, and the description of the Operations Centers would be the same as discussed in section 3.6.7, pages 3-40 to 3-41 of the Draft EIS.



Eccentric column diagram



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Straddle bent diagram

The two alternative locations being evaluated for an Operations Center are:

- **C-1 - Interbay.** This alternative would place the Operations Center on a triangular site located between 15th Avenue W, W Wheeler Street, and W Armory Way. Green Line trains would access the site via guideways at W Armory Way, connecting to the main guideways along 15th Avenue W. For the connections to the main guideways, switches and crossover tracks would be required.
- **C-2 - SODO.** This alternative would place the Operations Center between Utah and Colorado Avenues S, south of S Lander Street. Trains would enter the area using switches and crossover tracks from the main guideways.

3.2.3.1 Train Storage Facilities

To provide additional operational flexibility and efficiency, additional area may be required for train storage, similar to the train storage facilities provided within the Operations Center. Train storage facilities could include property with elevated storage guideways, and access guideways to and from the main line. Train storage tracks are anticipated in the Operations Center, and a potential location for additional train storage near Third Avenue S and S Lander Street is evaluated in this EIS. Single beam operations may also involve train storage facilities.

3.2.4 Bridges and Special Structures

This EIS is evaluating a variety of bridge types that could be constructed for the Green Line, including Ballard Crossing over the Lake Washington Ship Canal in Ballard, over the I-90/Fourth Avenue ramps in the north SODO Segment, over SR 99, the BNSF railroad, and Terminal 25 at the south SODO Segment, and over the Duwamish Waterway in the West Seattle Segment. The probable location and scale of these bridges has been identified (as described in Section 3.8 by segment), and information about bridge types and spans is also provided. Ongoing engineering and cost analysis, together with the information developed through the EIS process, including public comments, will influence the final design and construction of the bridges. SMP will coordinate its design and permitting efforts with the U.S. Coast Guard, the City of Seattle, and other state and federal resource agencies, and will continue to involve and inform the public throughout the permitting process.

The bridge designs and concepts under consideration include:

- Ballard Crossing
 - West (box girder, cable-stayed, or arch) with single or double beam configuration
 - Far West (box girder, cable-stayed, or arch)
 - East (box girder, cable-stayed, or arch)
- I-90 Ramp/SR 519 Bridge (box girder)
- SR 99/Alaskan Way Viaduct, BNSF railroad, Terminal 25 (at Horton) (box girder)
- West Seattle Bridge (strengthening box girder construction of existing bridge)
- New West Seattle Bridge (box girder)

The other bridges or special long spans needed are all proposed to be box girder, similar to the box girder type proposed for the Ballard Crossing. Additional key details about the anticipated approach to construction of the bridges are provided in Section 4.17, Construction.

3.2.5 Switches

A switch is a moveable guideway beam that connects one track to another. Single switches are approximately 90 feet in length. Switches would be needed in a variety of locations along the alignment. They would be needed when Green Line trains approach the Operations Center. Switches typically occur in pairs (called crossovers, approximately twice as long as a single switch) or larger sets to meet operational needs. Additional switches may be located at intervals along the alignment for a variety of reasons, including ensuring operational flexibility and system operation if a portion of guideway is closed for any reason; allowing more frequent service (often discussed as “headways,” or the time between trains) on heavily used sections of guideway (such as Downtown); queuing trains for event operations; for connections to potential pocket tracks; and to turn around if a section of the guideway begins operation prior to the completion of the entire alignment. Switches may be entirely supported by an elevated deck structure that encompasses the two directional guideway beams and the switching beam. Figure 3-37 on page 3-103 provides examples of switches used in similar systems.

3.2.5.1 Downtown Turnback

Many passengers will use the Monorail to travel around the Downtown area, traveling to the Downtown core, Pike Place Market, the Chinatown International District, the stadiums, Belltown, or Seattle Center. To provide the most efficient operations while optimizing service levels through the Downtown – both during nonrush hour times and before and after special events at Seattle Center or the stadiums, this EIS analyzes a “Downtown Turnback” option that would allow trains to turn back at the Weller/King station at the south and the Fifth and Broad station at the north, so that they can shuttle frequently through Downtown. The Downtown Turnback would not require extra guideway. Instead, it would use switches at both of the stations mentioned, to allow trains to change directions at the end of their downtown runs.

3.2.5.2 Switch Locations

The exact location of switches will be determined as part of the final guideway design. SMP engineers and systems analysts have identified likely potential locations for switches along the guideway, coordinating switch locations with alignment and station location recommendations. Potential switch locations are identified on the alignment drawings in Appendix LL. Following is a summary of proposed locations for switches in the Preferred Alternative alignment:

BALLARD

Location: South of Crown Hill Station

Description: A switch is proposed to be located on 15th Avenue W between NW 83rd and NW 80th Streets on the edge of a commercial property at 8055 15th Ave. NW.

Location: North of 65th Street Station

Description: A switch is proposed to be located on the street frontage parking of a veterinary clinic at 6525 15th Avenue NW and a vacant lot.

Location: South of 65th Street Station

Description: A switch is proposed to be located on 15th Avenue NW between NW 65th and NW 64th Streets.

Location: North of Market Street Station

Description: A switch is proposed to be located on 15th Avenue NW between NW 58th and NW 57th Streets in front of a Union 76 gas station.

INTERBAY/MAGNOLIA

Location: Operations Center

Description: Six switches are proposed leading into the Operations Center, along 15th Avenue W just south of W Armory Way, along 15th Avenue W just north of W Newton Street, and along 15th Avenue W between W Howe and W Newton Streets.

SEATTLE CENTER/QUEEN ANNE/BELLTOWN

Location: Downtown Turnback – North end at Fifth and Broad Station

Description: Two switches are proposed to be located along Fifth Avenue N between John and Broad Streets and between John Street and Denny Way. Air rights acquisition will be necessary over portions of three commercial properties located at 124 Fifth Avenue N, 118 Fifth Avenue N and 112 Fifth Avenue N.

Location: Fifth Avenue

Description: A crossover (two switches total) is proposed to be located along Fifth Avenue between Denny Way and Vine Street.

SODO/CHINATOWN INTERNATIONAL DISTRICT/PIONEER SQUARE

Location: Downtown Turnback – South end at Weller/King Station

Description: Four switches are proposed, three over the BNSF railroad tracks south of Weller/King Station and integrated with a long span structure, and one on Fourth Avenue S just north of the I-90 on-ramp.

Location: South of Safeco Station

Description: This switch would be located along Third Avenue S just north of S Atlantic Street.

Location: Seattle Public Schools John Stanford Center Parking Lot

Description: This switch would be located over the Seattle Public Schools' parking lot behind the John Stanford Center for Educational Excellence, integrated with a long span structure.

Location: South of Lander Station

Description: This switch is proposed to be located above the SODO Center parking lot, on the corner of S Lander Street and First Avenue S.

Location: S Horton Street

Description: This switch is proposed to be located on S Horton Street at the intersection with Colorado Avenue S, and integrated with a long span structure.

WEST SEATTLE

Location: Over Port of Seattle Terminal 25

Description: This switch is proposed to be located along S Spokane Street over Terminal 25, just north of the West Seattle Bridge.

Location: Northeast of Delridge Station

Description: This switch is proposed to be located near the Fire Department building at 3600 23rd Avenue SW, just south of the West Seattle Bridge.

Location: West of Delridge Station - Nucor

Description: This switch is proposed to be located over the eastbound lanes of SW Spokane Street, between the West Seattle Bridge and the Nucor Steel Plant.

Location: North of Avalon Station - Nucor

Description: This switch is proposed to be located in the center of SW Avalon Way just north of the intersection of SW Avalon Way and SW Genesee Street.

Location: South of Alaska Junction Station

Description: A switch is proposed to be located over the northeast street frontage of the parking lot of the Rite Aid store at 5201 California Avenue SW.

Location: North of Morgan Junction Station

Description: This terminus switch is proposed to be located over street frontage of the parking lot of the convenience store on the corner of California Avenue SW and SW Eddy Street.

Switch locations will continue to be evaluated and refined as final design work on the alignment continues.

3.2.6 Traction Power Substations

Monorail trains run on electric power, which is supplied through traction power substations. Operational analysis of the alignment alternatives indicates that the Green Line would require between 10 and 20 traction power substations, depending on the design and technology used. If the substations all have redundant capacity, approximately 10 larger substations would be required, each up to 2,100 square feet. If no substations have redundant capacity, approximately 20 smaller substations would be required. Substations are generally built as enclosed structures, although they require ventilation to the outside and would likely have a large door to allow for equipment service, repair, or replacement. The size of the power stations would range from approximately 1,200 to 2,100 square feet. Traction power substations can be integrated into other structures such as stations.

3.3 STATION TYPES

The voter-approved Seattle Popular Monorail Plan noted that the Green Line would have up to 19 stations and up to six potential future stations. The approximate station locations were identified in the Plan as “station vicinities,” typically areas in the vicinity of a transit hub, major intersection, or key destination. Although this EIS analyzes alternative station locations at a number of station vicinities, inclusion in the EIS does not imply that a station would be built at each location. For each station location considered, SMP may ultimately choose any of the following: select one of the alternative locations and station types for permitting, final design and construction; select a location and station type with similar environmental

impacts to those specifically considered; construct the guideway so as to allow for construction of a station at the specified location in the future; or determine not to build a station at that location.

In several segments, including Interbay and Downtown, the EIS considers station alternatives in more locations than are anticipated to be selected for construction. The ultimate decision on the number of Green Line stations will be based on a number of factors, including but not limited to ridership, travel times, cost, distance to other stations, environmental impacts, and community support.

Station planning objectives and location principles were described in the Draft EIS on pages 3-9 to through 3-10, and have remained unchanged since the publication of the Draft EIS.

This EIS evaluates seven basic types of station structures, as described below and shown in Figure 3-5.

3.3.1 Center Platform Station

With this type of station, the platform would be positioned between the trains, so that all passengers would proceed to the same, central platform regardless of their intended direction of travel. Access would be provided from the street level directly to the platform by means of stairs and an elevator and in some cases an escalator.

3.3.2 Center Platform Station with Mezzanine

For this type of station, the platform would be positioned between the trains, but access would be provided from the street level via an intermediate mezzanine level. A mezzanine station would be taller than a non-mezzanine station and would place more bulk over the street right-of-way. Mezzanines would be used when it is desired to provide access to the station from both sides of the street, or to connect with another building or structure. In addition, mezzanines would be desirable for stations developed over the street right-of-way. Station mezzanines could be developed to function as public concourses and could span roads or connect to adjacent developments or civic facilities. The mezzanine level could provide a convenient location for ticketing. Because a mezzanine station would typically be higher than a center platform station without a mezzanine, the approaching guideways would be higher as well.

3.3.3 Side Platform Station

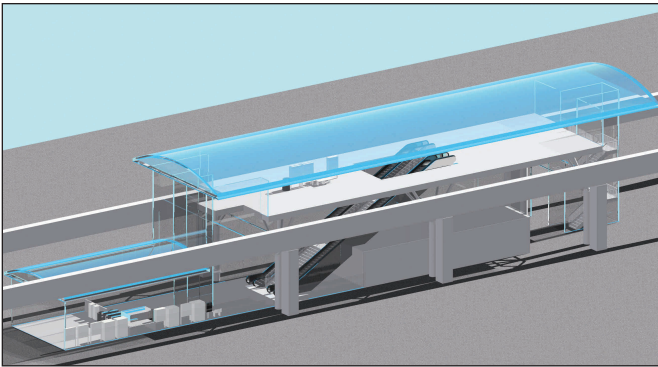
In a side platform station, one platform would be positioned on either side of the trains. Passengers would reach the platforms directly from street level. These stations would typically be wider than center platform stations because they would have two separate platforms rather than one.

3.3.4 Side Platform Station with Mezzanine

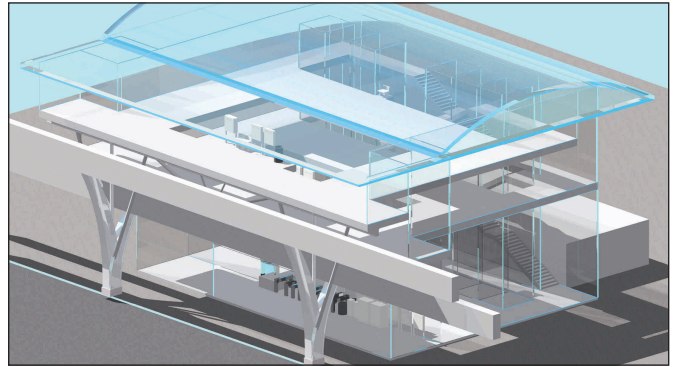
In this type of station, a mezzanine would extend beneath both platforms to provide an intermediate level that could be used for ticketing or to span a street or connect to another facility. With a mezzanine, the station structure and approaching guideways would typically be higher than a side platform station without a mezzanine.

3.3.5 Vertical Station

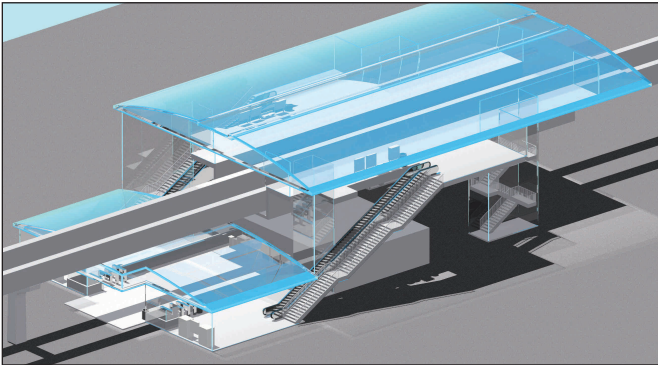
A vertical station would be used with vertically arranged guideway beams. Station platforms would be located on two levels, with passengers reaching the upper platform via the lower one. A vertical station could be constructed independent of the guideway, allowing the station to be developed inside an existing or new adjacent building with platforms that would connect to the trains. Vertical stations would be approximately the same height as mezzanine stations.



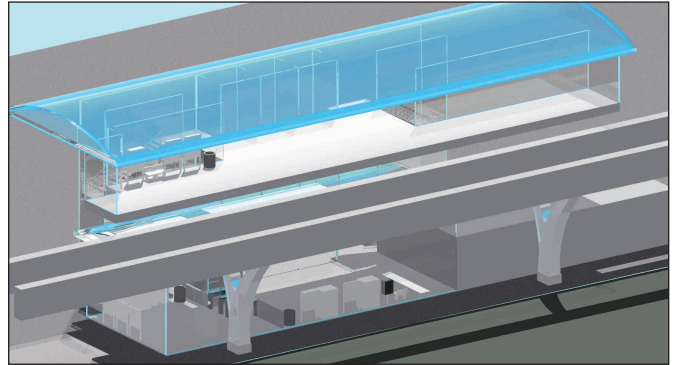
Center Platform Station



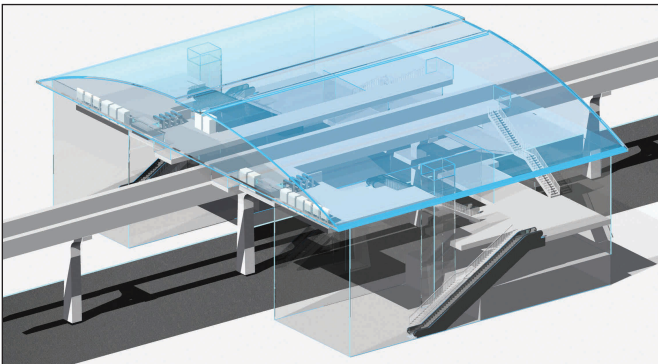
Elevator Station



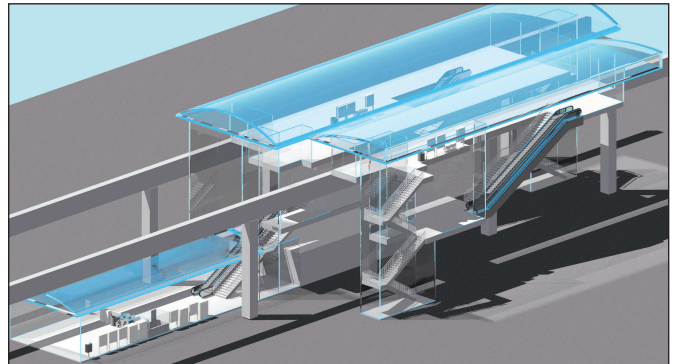
Side Platform Station



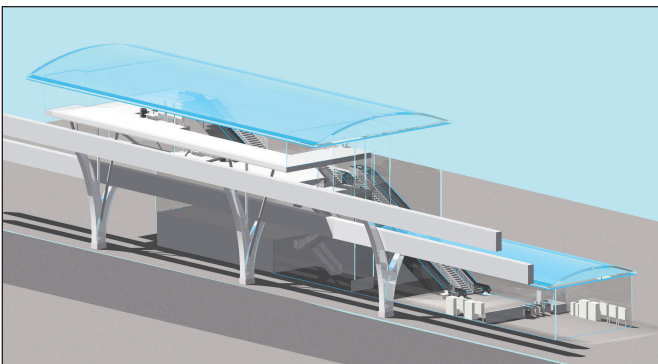
Terminus Station



Side Platform Station with Mezzanine



Event/Turnback Station



Vertical Station

NOT TO SCALE

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**Figure 3-5
Examples of Typical
Station Types**

3.3.6 Event/Turnback Station

A Downtown Turnback, created with switches on the guideway, is evaluated in this EIS to allow trains to shuttle back and forth through the Downtown core between Seattle Center and the stadiums to offer more frequent service in this high ridership area. The two turnback points, at the Fifth and Broad station and the Weller/King station, are evaluated with design options for special stations that would be designed both to accommodate the switches needed for the Downtown Turnback, as well as with an additional platform for exiting passengers to accommodate large event crowds at Seattle Center and the stadiums.

3.3.7 Terminus Station

In response to comments, SMP has designed options for special terminus stations at the end of the line in Ballard and West Seattle. The stations would be smaller in height and width than a typical vertical or horizontal station because they would require only one platform instead of two. Passengers would enter or exit the monorail from a single platform. The stations would still have adequate capacity to handle additional passengers if the line were eventually extended.

3.3.8 Elevator Station

Any of the stations described above may be designed as elevator stations to be more compact. In an elevator station, large capacity elevators with glass walls for visibility would shuttle passengers quickly from street level to the platforms, providing particularly convenient access for people with disabilities or those with strollers, luggage or bicycles. Stairs would still be provided at least for emergency access.

3.4 SYSTEM OPERATIONS

SMP has drafted preliminary operating requirements for the Green Line. The draft operating requirements are used in this EIS to depict the key characteristics of the Green Line's operations plan, including the expected schedules, hours of operation, passenger capacities, and travel times for the Green Line. Although project construction phasing may allow shorter segments of the Green Line to be completed and operated initially, the environmental analysis considers the requirements for the full length of the alignment to represent the highest range of system operations and ridership. An initial operations plan will be developed and approved as part of the Design-Build-Operate-Maintain contracting phase of the project, although SMP may adjust operations after the system has begun to maximize service efficiency.

The Green Line is currently expected to operate up to 19 hours a day, 365 days a year, with passenger service beginning at 5:00 a.m. each day and ending at midnight. The precise hours of operation and duration may vary during the life of the project. Peak service would be offered weekday mornings from 6:00 to 9:00 a.m. and weekday evenings from 4:00 to 7:00 p.m. Other periods would offer off-peak service, although event service may operate near peak levels before and after a scheduled event. Upon full system opening (planned for 2009, although SMP plans to begin operation on a shorter segment on December 15, 2007), peak period trains are expected to run about every four to six minutes in each direction, accommodating approximately 2,000 to 3,000 passengers per hour per direction.

Green Line trains are expected to complete the 14-mile route in approximately 30 minutes, with an average travel speed of between 20 to 25 miles per hour, including changes in speed as trains approach and leave stations. The average travel speed also includes a typical station dwell time of 20 seconds for passenger loading and unloading, although individual stations could have dwell times ranging from between 10 to 120 seconds depending on passenger loads and system operating and schedule needs. Between stations, the trains could travel up to a maximum speed of about 50 mph.

3.5 MONORAIL CONSTRUCTION

The initial construction of the Green Line would include approximately 14 miles of elevated guideways and up to 19 stations, and would be a major construction project in the Seattle area. Green Line construction would likely begin in 2005 and to continue into 2009, with system testing and integration and finish construction efforts occurring up to the start of full line operation in 2009. SMP would begin initial operation of a segment of the Green Line on December 15, 2007, with construction in other segments continuing until full system completion. The precise parameters of the initial line will depend on a number of factors, including the location of the Operations Center. As proposed in the RFP, the minimum operating segment for the first part of construction will extend from the Seattle Center/Queen Anne station to the Fifth and Stewart station. Major construction activities within the six geographic segments would typically be conducted within an approximately 24-month period. The activities during this time could be intermittent, and would vary in intensity. However, in some locations, particularly downtown Seattle, utility relocation, complex structures, or site-specific considerations could require additional time. Construction activities would be coordinated and phased to minimize the extent of any potential impacts to the surrounding communities. In addition, construction activities would meet the requirements as established in the construction permits.

The major components of the project to be constructed are the guideways (including bridges and special structures), the stations, and the Operations Center. The overall construction period would include a period of civil construction during which site preparation, utilities relocation, and final construction of guideways, columns, stations, bridges, and Operations Center would take place, followed by a period of system installation, integration, and testing. See Section 4.17, Construction, for more detail on construction activities and potential impacts.

3.6 NO ACTION ALTERNATIVE

The No Action Alternative represents the transportation system and the environment as they would exist without the Green Line. The No Action Alternative provides a baseline condition for comparing the impacts of Green Line alternatives. A key element of the No Action Alternative is the population, housing and employment growth, and transportation conditions that have been forecast for the region for the years 2010 and 2020.

The No Action Alternative incorporates planned changes in existing land use and related increases in population and employment consistent with Puget Sound regional forecasts and adopted city, county, and regional plans. It also includes the existing transportation system with funded projects in the Puget Sound Regional Council's (PSRC) adopted Transportation Improvement Plan as of November 2002. The No Action Alternative assumes that neither the Green Line nor any other future monorail line would be built.

3.7 DEVELOPMENT AND ANALYSIS OF ALTERNATIVES AND SELECTION OF A PREFERRED ALTERNATIVE

This Final EIS presents a Preferred Alternative for the Green Line, which has been developed, updated, and refined based on public comments as well as design, technical, engineering, and environmental studies.

- **EIS Scoping Process: January – February 2003.** To solicit public comments at the start of the EIS process, SMP and the U.S. Coast Guard invited community members and public agencies to public workshops and informational meetings. SMP received over 7,000 comments during its scoping period in January and February 2003 (all of which were reviewed by SMP and the U.S. Coast Guard) and attracted over 1,700 participants to a series of community workshops during January 2003.

SMP also conducted urban design, engineering, and operational studies of different alignment and station alternatives along the voter-approved Green Line route, and used available environmental information, including information from the Seattle Popular Transit Plan Programmatic EIS and findings from initial environmental analysis to develop potential alternatives.

- **Preliminary Preferred Alternative: April 2003.** On April 2, 2003, SMP published a document entitled “Building the Monorail: Seattle Monorail Project Preferred Alternative.” This document contained the SMP staff recommendation for a Preliminary Preferred Alternative as of that date to help inform community members and agency partners. However, a Preferred Alternative was not presented in the Draft EIS. Instead, that early staff recommendation was published to solicit and focus public comment.
- **Draft EIS Alternatives Analysis: April – August 2003.** Based on public comment and a community involvement process that was conducted around the Preliminary Preferred Alternative, as well as additional technical and design work, SMP developed reasonable alternatives for inclusion in the Draft EIS. The Draft EIS examined alternatives that are consistent with the voter-approved Seattle Popular Monorail Plan. The alternatives it examined were organized into geographic segments for ease of analysis, although the Draft EIS noted that station and alignment alternatives that were presented in the Draft EIS could be ‘mixed and matched’ as desired. Additional information on the ‘mix and match’ concept can be found in the November 2003 Preliminary Staff Recommendation and the January 2004 Final Staff Recommendation, which are incorporated by reference.

Numerous other alignment and station alternatives in addition to those analyzed in the Draft EIS were considered during the scoping process. Alternatives that were considered but not carried forward for further detailed evaluation in this EIS are discussed in Appendix B of the Draft EIS. That appendix also described the reasons for not carrying forward these alternatives, which include inconsistency with the Seattle Popular Monorail Plan and the purpose and need of the Project, technical and economic infeasibility, environmental impacts, or similar or identical impacts to alternatives included in the Draft EIS. An updated description of these alternatives can be found in Appendix PP.

- **Draft EIS Comment Period: August – October 2003.** After the publication of the Draft EIS, SMP and the U.S. Coast Guard held a 45-day public comment period, which extended from August 29 through October 14, 2003. This public comment period included a public hearing, which was held on September 29, 2003 at the Northwest Rooms at Seattle Center. SMP and the U.S. Coast Guard received over 400 written or spoken comments during this period.
- **Preliminary Staff Recommendation: November 2003.** In response to comments received following the publication of the Draft EIS, the SMP conducted additional engineering and design work, and developed a number of updates and refinements to the alignment and station location alternatives for inclusion in the Final EIS. In addition, to provide focus for continued community involvement, SMP staff published a “Preliminary Staff Recommendation” on November 18, 2003. That Preliminary Staff Recommendation summarized SMP staff’s preliminary preferred alternative at that time and was presented at two city-wide open houses on November 18 and 19, 2003, which were attended by over 2,000 people.
- **Final Staff Recommendation and EIS Preferred Alternative: January 2004.** Based on comments received at the November open houses, as well as continuing engineering and design work, SMP staff presented a recommendation for Green Line alignment and station locations to the SMP Board in January 2004. That recommendation is designated as the **Preferred Alternative** for this EIS. It is also called the Final Staff Recommendation (FSR).

The Preferred Alternative does not reflect SMP Board or U.S. Coast Guard action. Instead, it is presented to designate SMP staff's recommendation. All other alternatives that were analyzed in the Draft EIS, as well as the additional updates and clarifications prepared in response to comments, are also carried forward in this Final EIS, and are analyzed at the same level of detail as the Preferred Alternative. More detail is provided on mitigation measures that would be implemented based on the adoption of the Preferred Alternative. A broad range of potential mitigation measures is identified in the EIS; commitments to specific mitigation measures to date for the Preferred Alternative are discussed in Chapter 5.

SMP only has authority and funding to construct a monorail that is consistent with the Green Line as described in the Seattle Popular Monorail Plan and approved by the voters. For this reason, all alternatives evaluated in the EIS were selected based on their ability to conform to the voter-approved Plan. Potential alternatives that did not conform with the Seattle Popular Monorail Plan's description of the Green Line, including those that suggested other technologies, other routes, or other transportation system improvements are essentially No Action, because SMP does not have authority to undertake those alternatives. Any deviation from the Green Line route as described in the Seattle Popular Monorail Plan would require voter approval.

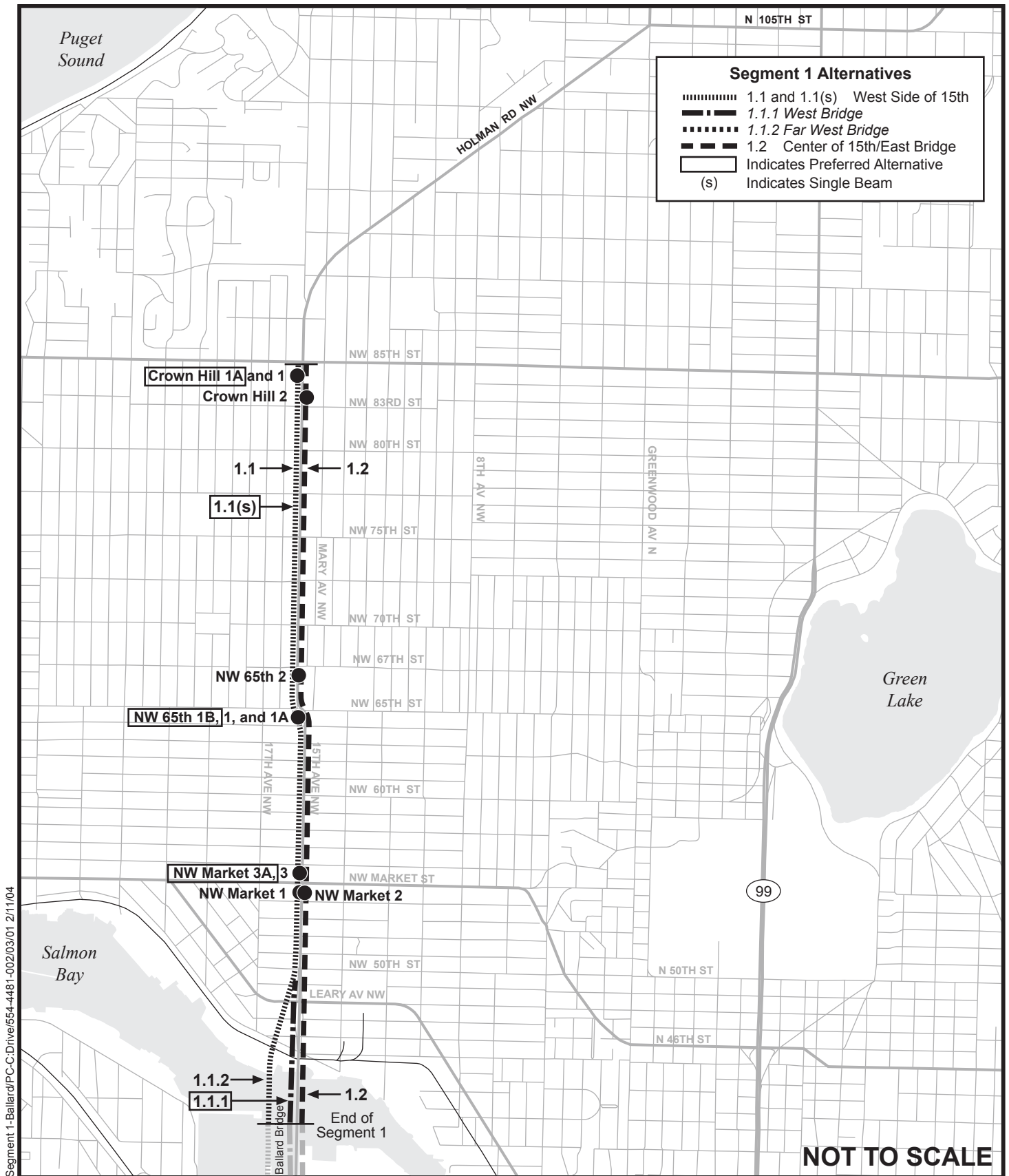
3.8 DESCRIPTIONS OF THE GREEN LINE ALIGNMENT AND STATION ALTERNATIVES

The alignment and station alternatives that were evaluated in this EIS are listed in Tables 3-1 and 3-2 and described in more detail in the following sections. Figures 3-6 to 3-10 depict the location of the alternatives by geographic segment. The engineering and architectural conceptual designs that were developed for the purpose of the EIS analysis, including street cross-sections showing the location of Green Line columns within the street right-of-way, are included in Appendix LL of this Final EIS.

In the tables below, Green Line alignment and station alternatives are packaged together into segment and system-wide groupings for ease of analysis. However, these packages, including the Preferred Alternative, should be understood to be interchangeable, and the Green Line may ultimately be constructed using a combination of alignments and stations that contains elements from the different system-wide groupings, as well as options with similar or reduced overall environmental impacts. The SMP November 2003 Preliminary Staff Recommendation and January 2004 Final Staff Recommendation contain additional information on "mix and match" subsegments. These documents are available at SMP's office or at elevated.org. The Preferred Alternative for each segment is identified in the tables below and in the descriptions that follow. However, as noted in Section 3.5, although mitigation measures were developed with more specificity for the Preferred Alternative, all alternatives were analyzed with the same level of detail with respect to areas of the environment covered in Chapter 4.

3.8.1 Ballard Segment

The Green Line in this segment extends along 15th Avenue NW from the Crown Hill area of Ballard south to cross the Lake Washington Ship Canal. Up to three stations could be constructed within the segment, with stations evaluated at or near NW 85th Street, NW 65th Street, and NW Market Street.

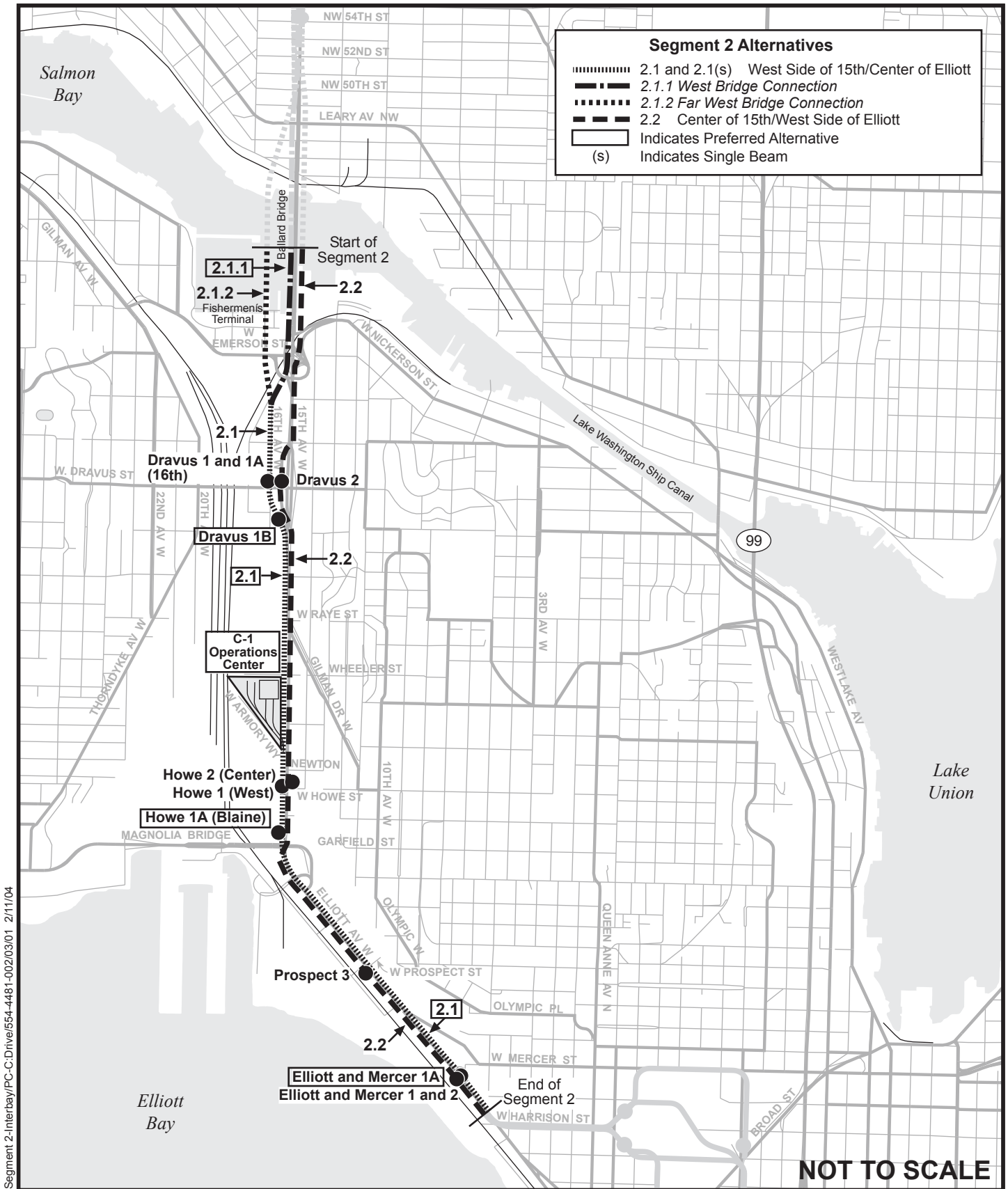


Segment 1-Ballard/PC-C:/Drive/554-4481-002/03/01 2/1/04

SEATTLE MONORAIL PROJECT



**Figure 3-6
Segment 1: Ballard**



Segment 2-Interbay/PC-C:Drive/654-4481-002/03/01 2/11/04

SEATTLE MONORAIL PROJECT



Figure 3-7
Segment 2: Interbay/Magnolia

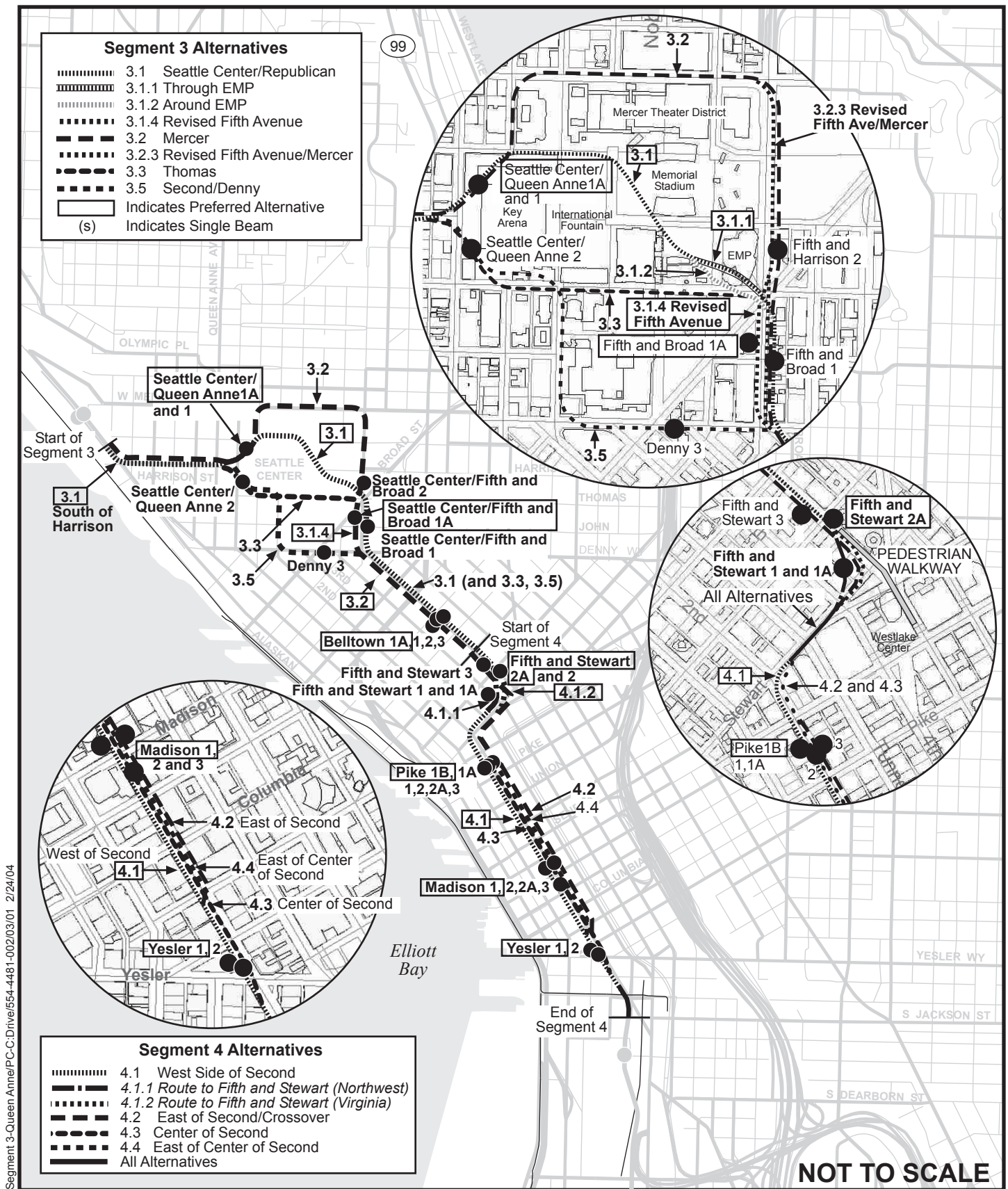
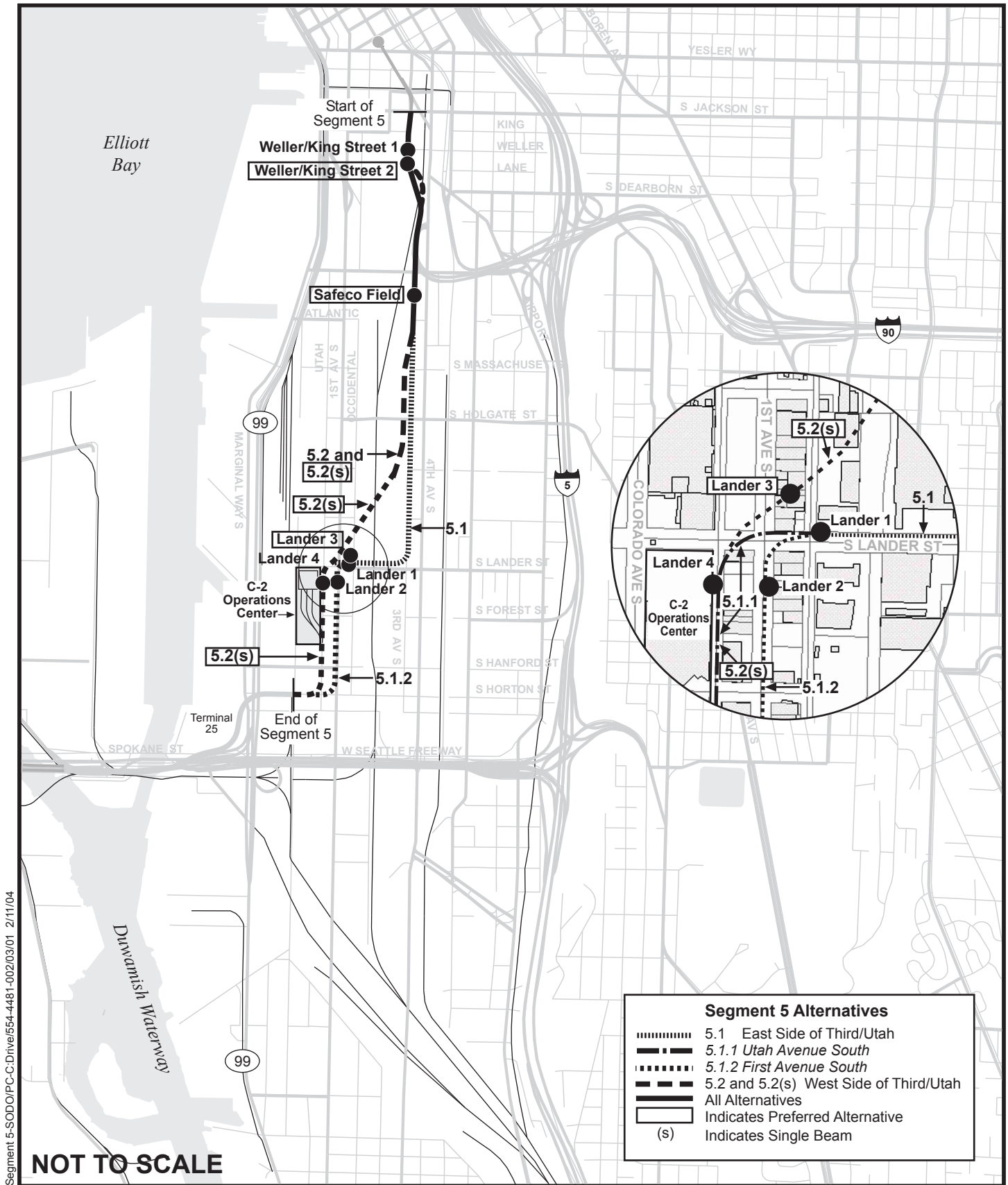


Figure 3-8
Segments 3 and 4: Queen Anne/
Seattle Center/Belltown and
Downtown/Pioneer Square



Segment 5-SODO/PC-C:Drive/554-4481-002/03/01 2/11/04

SEATTLE MONORAIL PROJECT



Figure 3-9
Segment 5: SODO/Chinatown
International District/Pioneer Square

Table 3-1. Summary of Green Line Alignment Alternatives

Alternative Number/Name	Key Features
Segment 1: Ballard	<i>See Figure 3-6 for an area depiction and pages 3-26 to 3-29 for more detail.</i>
1.1 – West Side of 15 th	From NW 85 th Street along west side of 15 th Avenue NW, to a new bridge over the Ship Canal on the west side of the existing Ballard Bridge. Columns for the alignment would be placed in the existing southbound a.m. peak travel/parking lane of 15 th Avenue NW. A dual beam configuration is evaluated throughout this segment. The stations evaluated with this alternative include Crown Hill 1 or 1A (West, 85 th), NW 65 th 1 or 1A (West), and NW Market 1 (Southwest) or 3 (Northwest).
1.1(s) – West Side of 15 th with single beam	A single beam configuration for a west side of 15 th Avenue NW alignment alternative north of NW Market Street with a horizontal dual beam passing area at the NW 65 th Street Station, and a dual beam vertical configuration at the NW Market Station. The stations evaluated with this alternative are Crown Hill 1A (West, 85 th), NW 65 th 1B (West), and NW Market 3A (Northwest).
1.2 – Center of 15 th	From NW 85 th Street, along the center of 15 th Avenue NW (occupying the center two-way turn lane) to about NW 51 st Street, then east of 15 th Avenue NW to a new bridge (also referred to as Alternative 1.2) over the Ship Canal east of the existing Ballard Bridge. A horizontal dual beam configuration is studied throughout. The stations evaluated with this alternative are Crown Hill 2 (Center), NW 65 th 2 (Center), and NW Market 2 (Center).
Ballard Crossing	The EIS analyzes four alternatives for a monorail-only bridge to be constructed over the Lake Washington Ship Canal. All bridge alternatives could be designed as box girder, arch, or cable-stayed structures: • Alternative 1.1.1 (West Bridge) would be a horizontal dual beam configuration just west of the existing Ballard Bridge. • Alternative 1.1.2 (Far West Bridge) would be a horizontal dual beam configuration approximately 200 feet west of the existing Ballard Bridge. • Alternative 1.1.1(s) (West single beam Bridge) would be a single beam box girder configuration 40 to 50 feet west of the existing Ballard Bridge. • Alternative 1.2 (East Bridge) would be a horizontal dual beam configuration located east of the existing Ballard Bridge.
Ballard Preferred Alternative	The Preferred Alternative for Ballard is Alternative 1.1(s), which would be a single beam configuration along the west side of 15th Avenue NW. It would include dual beam passing areas at the NW 65th and NW Market Stations. It would travel to the Alternative 1.1.1 West Bridge, which would have a dual beam horizontal configuration on a box girder type bridge. The stations for the Preferred Alternative are Crown Hill 1A (West, 85th), NW 65th 1B (West), and Market 3A (Northwest).

Table 3-1. Summary of Green Line Alignment Alternatives (continued)

Alternative Number/Name	Key Features
Segment 2:	<i>See Figure 3-7 for an area depiction and pages 3-29 to 3-30 for more detail.</i>
Interbay/Magnolia	
2.1 – West Side of 15 th / Center of Elliott	From the new bridge west of the Ballard Bridge over the Port of Seattle Fishermen's Terminal to the west side of 16th Avenue W and W Dravus Street, then continuing along the west side of 15th Avenue W, over the Galer Flyover and Magnolia Bridge to the center of Elliott, occupying the existing two-way left turn lane. The alignment would connect from the Ship Canal Bridge in one of two ways depending on which bridge alternative is selected: • Alternative 2.1.1, West Bridge Connection; or • Alternative 2.1.2, Far West Connection Stations evaluated with Alternative 2.1 are Dravus 1, 1A (16th) and 1B (Barrett), Howe 1 (West) and 1A (Blaine), and Elliott and Mercer 1 and 1A (Center). The guideways would be horizontally arranged except when approaching the stations at W Dravus Street and W Mercer Street where a vertical arrangement could be used depending on the station alternative selected. A dual beam configuration is evaluated throughout.
2.1(s) – West Side of 15 th /Center of Elliott with single beam	An alignment along the west side of 16th Avenue W and 15th Avenue W and the center of Elliott Avenue W with a single beam configuration north of the Elliott and Mercer Station and horizontal dual beam passing areas at the Dravus and Howe/Blaine Stations. Stations evaluated with Alternative 2.1(s) are Dravus 1B (Barrett), Howe 1A (Blaine) and Elliott and Mercer 1A (Center).
2.2 – Center of 15 th / West Side of Elliott	From the new bridge east of the Ballard Bridge to 15th Avenue W and W Dravus Street, then crossing to the center of 15th Avenue W, occupying the existing two-way left turn lane, then crossing west over the W Garfield street overpass and continuing on the west side of Elliott Avenue W, occupying the existing southbound parking/a.m. peak travel lane. A dual beam horizontal configuration is evaluated throughout. Stations evaluated with Alternative 2.2 are Dravus 2 (15th), Howe 2 (Center) or Prospect 3 (West), and Elliott and Mercer 2 (West).
Interbay/Magnolia Preferred Alternative	The Preferred Alternative for Interbay is Alternative 2.1 on the west side of 16th Avenue W and 15th Avenue W and the center of Elliott Avenue W, with stations at Dravus and Elliott/Mercer, and with the guideway constructed in anticipation of a future station at Howe/Blaine. The Preferred Alternative includes an Operations Center west of 15th Avenue W near W Armory Way (Operations Center C-1). The Preferred Alternative Stations are Dravus 1B (15th), Howe 1A (Blaine; future station), and Elliott and Mercer 1A (Center).

Table 3-1. Summary of Green Line Alignment Alternatives (continued)

Alternative Number/Name	Key Features
Segment 3: Queen Anne/ Seattle Center/ Belltown	<i>See Figure 3-8 for an area depiction and pages 3-30 to 3-33 for more detail.</i>
W Harrison Street, from First Avenue N to Seattle Center	Two alignments along W Harrison Street are evaluated as part of the Segment 3 alternatives. Alternative 3.1 (Seattle Center/Republican): South side of W Harrison in an existing parking lane with a horizontal dual beam configuration. Alternative 3.2 (Mercer): North side of W Harrison in an existing parking lane with a horizontal dual beam configuration. Alternative 3.3 (Thomas): Same as Alternative 3.1. Alternative 3.5 (Second/Denny): Same as Alternative 3.1.
Seattle Center Area, First Avenue N to Fifth Avenue N/Denny Way	Four alignment alternatives are studied in the Seattle Center area, two through and two around the Center. All four would travel in a horizontal dual beam configuration throughout this area of the segment. Alternative 3.1 (Seattle Center/Republican): Crossing from W Harrison Street over First Avenue N to a station (Seattle Center/Queen Anne 1 or 1A; North) northwest of Key Arena, then following Republican Street past Memorial Stadium and the International Fountain (called the 'Northwest Route') through Seattle Center. In Seattle Center, there are two alternatives in the area of the Experience Music Project (EMP): • Alternative 3.1.1 would travel through the EMP • Alternative 3.1.2 would travel around the EMP Alternative 3.1.3 continues over the east side of Fifth Avenue N to a station near Broad Street (Fifth and Broad 1 Station) with an optional tail track. Alternative 3.1.4 would travel over the center of Fifth Avenue N to the Fifth and Broad 1A Station. Alternative 3.2 (Mercer): From Seattle Center/Queen Anne 1 or 1A (North) Stations to the northwest of Key Arena to the west side of Warren Avenue N then to the north side of Mercer Street around Seattle Center. The original alignment would then travel along the east side of Fifth Avenue N to the Fifth and Broad 2 station. A revised alignment (Alternative 3.2.3) would separate the guideways to the east and west sides of Fifth Avenue N. to approach the Fifth and Broad 1A Station at Broad Street. Alternative 3.3 (Thomas): From a Seattle Center/Queen Anne 2 (South) Station, southwest of Key Arena, continuing east on Thomas Street through Seattle Center. The alignment would then travel over the center of Fifth Avenue N to a station at Broad Street (Fifth and Broad 1; Southeast) Alternative 3.5 (Second/Denny): From a Seattle Center/Queen Anne 2 (South) Station southwest of Key Arena, then following the west side of Second Avenue N, then crossing to the south side of Denny Way (using an existing travel lane), and proceeding along Denny to Fifth Avenue, with the Denny 3 Station near Fourth Avenue.

Table 3-1. Summary of Green Line Alignment Alternatives (continued)

Alternative Number/Name	Key Features
Fifth Avenue (from Denny Way to Virginia Street)	Two alignment alternatives are evaluated for Fifth Avenue in Belltown. Alternative 3.1 (Seattle Center/Republican): Along the center of Fifth Avenue in a vertical dual beam configuration. The station alternatives evaluated are Belltown 1, 1A (Center-West) or 2 (Center-East). Alternative 3.2 (Mercer): West side of Fifth Avenue in a horizontal dual beam configuration transitioning into a vertical configuration at a station (Belltown 1 or 1A; Center-West) or Belltown 3 (West) near Bell Street. This alignment alternative studied conditions along Fifth Avenue with and without the presence of the guideway beams and columns from the existing Seattle Center monorail: • Alternative 3.2.1 would remove the existing monorail • Alternative 3.2.2 would retain the existing monorail Alternative 3.3 (Thomas): Same as Alternative 3.1. Alternative 3.5 (Denny): Same as Alternative 3.1.
Queen Anne/Seattle Center/Belltown Preferred Alternative	The Preferred Alternative for this area would travel along the south side of W Harrison Street (Alternative 3.1), through the Seattle Center on the path of Republican Street and through the EMP (Alternative 3.1.1), along the center of Fifth Avenue N (Alternative 3.1.4), and along the west of Fifth Avenue through Belltown with the existing monorail guideways removed (Alternative 3.2.1). The Preferred Alternative Stations are Seattle Center/Queen Anne 1A (North), Seattle Center/Fifth and Broad 1A, and Belltown 1A (Center-West).
Segment 4: Downtown/Pioneer Square	<i>See Figure 3-8 for an area depiction and pages 3-33 to 3-36 for more detail.</i>
4.1 – West Side of Second	From Fifth Avenue, this alternative evaluates two options for turning west at Stewart Street: • Alternative 4.1.1 (Fifth and Stewart (Northwest)): A diagonal alignment across the block at the northwest corner of the intersection of Fifth Avenue and Stewart Street, serving Fifth and Stewart Stations 1 (Northwest) or 1A (West) • Alternative 4.1.2 (Fifth and Stewart (Virginia)): With a station near Virginia Street (Fifth and Stewart 2 (Virginia) or 2A (Virginia Center) following Fifth Avenue until turning west south of the center of Stewart Street. From Stewart Street to Second Avenue, then proceeding south on the west side of Second Avenue in the existing bus and parking lane. Dual beam guideways would be horizontally arranged between stations and would transition in and out of a vertical configuration at stations. West-side alignment stations on Second Avenue are Pike 1A and 1B (West), Madison 1 (West), and Yesler 1 (West).
4.2 – East Side of Second with Crossover	From Fifth Avenue, turning west at Stewart Street, then proceeding south on the east side of Second Avenue, crossing to the west side of Second south of Marion Street. The columns would be in an existing parking lane on the east, and then in a bus and parking lane on the west. Dual beam guideways would be horizontally arranged in most locations. Stations evaluated are Fifth and Stewart 3 (Lenora), Pike 2 (East), Madison 2 (East) and Yesler 2 (Center).

Table 3-1. Summary of Green Line Alignment Alternatives (continued)

Segment 4: Downtown/Pioneer Square		<i>See Figure 3-8 for an area depiction and pages 3-33 to 3-36 for more detail.</i>
4.3 – Center of Second	From Fifth Avenue, turning west at Stewart Street, then proceeding south in the center of Second Avenue. The guideway columns would occupy an existing travel lane, and dual beam guideways would be horizontally arranged in most locations. Stations evaluated are Fifth and Stewart 2 (Virginia), Pike 3 (Center), Madison 3 (Center) and Yesler 2 (Center).	
4.4 – East of Center Option	From Fifth Avenue, turning west at Stewart Street to follow the south side of Stewart to Second Avenue, where the dual beams would be horizontally arranged and columns would occupy an existing travel lane (one lane east of the location of Alternative 4.3). South of Marion Street, the alignment would cross to the west side of Second and be vertically arranged, the same as Alternative 4.2. Stations evaluated are Fifth and Stewart 3 (Lenora), Pike 2A (East-Center), Madison 2A (East-Center) and Yesler 1 (West)	
Downtown/Pioneer Square Preferred Alternative	The Preferred Alternative for Downtown is Alternative 4.1, along the west side of Second Avenue. It would feature the 4.1.2 (Virginia) transition from Fifth Avenue that allows for a west of center alignment along Fifth and the Fifth and Stewart 2A (Virginia Center) Station. Along Second Avenue, the dual guideways would transition between a vertical arrangement at stations and a horizontal arrangement between stations to minimize visual impacts. In addition to Fifth and Stewart 2A (Virginia Center), the stations are Pike 1B (West), Madison 1 (West), and Yesler 1 (West).	
Segment 5: SODO/Chinatown International District/Pioneer Square		<i>See Figure 3-9 for an area depiction and pages 3-36 to 3-38 for more detail.</i>
5.1 – East Side of Third/Utah	Horizontally arranged dual beams following the east side of Third Avenue S (with columns in an existing parking area) to the north side of S Lander Street, then traveling south on one of two parallel streets: • Alternative 5.1.1 would travel along Utah Avenue S; with Lander 4 (Utah) • Alternative 5.1.2 would travel along First Avenue S; with Lander 2 (Southwest) The alignment would then travel west on the north side of S Horton Street. Stations evaluated for Alternative 5.1 are Weller/King Street 1 (Standard), Safeco Field 1, and Lander 1 (Northeast), 2 (Southwest) or 4 (Utah).	
5.2 – West Side of Third/Utah	Following the west side of Third Avenue S in an existing parking area, turning southwest about a block north of S Lander Street to align with Utah Avenue S, and then west on the north side of S Horton Street. This alternative has been refined in response to comments to feature refined, shorter spans across the railroad tracks, a sharper diagonal alignment in the Lander area, and longer spans to allow for truck turning movement on Utah Avenue S and S Horton Street. Stations evaluated are Weller King Street 2 (Event) and Lander 3 (Diagonal).	
5.2(s) – West Side of Third/Utah with single beam	This alternative would feature a horizontal dual beam configuration to serve stations at Weller/King and Safeco and then would follow the west side of Third Avenue S in an existing parking area in a single beam configuration. It would turn southwest about a block north of S Lander Street and would feature a dual beam passing area at Lander Station. It would then transition back to a single beam configuration to align with Utah Avenue S and travel to the north side of S Horton Street with a dual beam passing area near S Horton Street. Stations evaluated with the single beam section are Weller/King 2 (Event), Safeco 1 and Lander 3 (Diagonal).	

Table 3-1. Summary of Green Line Alignment Alternatives (continued)

Segment 5: SODO/Chinatown International District/Pioneer Square	<i>See Figure 3-9 for an area depiction and pages 3-36 to 3-38 for more detail.</i>
SODO/Chinatown International District/Pioneer Square Preferred Alternative.	The Preferred Alternative for the SODO Segment is Alternative 5.2(s), which would follow the west side of Third Avenue S and travel diagonally near S Lander Street to the west side of Utah Avenue S to the north side of S Horton Street. It would feature single beam sections along Third Avenue S and Utah Avenue S with dual beam passing areas near the Lander Station and near S Horton Street. The Preferred Alternative Stations are Weller/King 2 (Event), Safeco 1, and Lander 3 (Diagonal).
Segment 6: West Seattle	
	<i>See Figure 3-10 for an area depiction and pages 3-38 to 3-41 for more detail. Alternatives in the West Seattle Segment are arranged in subsegments to facilitate comparison of impacts for the specific choices to be made in each area. These alternatives have been numbered to correspond with full-length alignments through West Seattle, but they do not preclude other combinations.</i>
Duwamish Crossing	Three alignment choices across the Duwamish River have been evaluated but are interchangeable with other areas in the West Seattle Segment. Alternative 6.1 (West Seattle I): Horizontal dual beam guideways crossing over SR 99 past Terminal 25 to the center of the West Seattle High-Rise Bridge. This alternative features two possibilities for departing the bridge: • Alternative 6.1.1 (Past Pigeon Point) departs the bridge near Delridge Way SW • Alternative 6.1.2 (To Pigeon Point) departs the bridge at the north end of the West Duwamish Green belt. Alternative 6.1(s) (West Seattle I – single beam): A single beam guideway crossing over SR 99 past Terminal 25 to the center of the West Seattle High-Rise Bridge. This alternative also features Alternative 6.1.1(s) (past Pigeon Point) for departing the bridge. Alternative 6.2 (West Seattle II): Horizontal dual beam guideways crossing over SR 99 past Terminal 25, then crossing the Duwamish River on a new monorail-only bridge north of the West Seattle High-Rise Bridge.
Delridge Subsegment (from Delridge Way SW to Avalon Way SW)	Six alternatives are evaluated in the Delridge area. Again, regardless of their numbering, any of these alternatives can be paired with any alignment from the Duwamish Crossing or any other area of West Seattle. Alternative 6.1 (West Seattle I): Horizontal dual beams traveling on the northwest side of Delridge Way SW to SW Yancy Street to the existing turn lane in the center of SW Avalon Way, with Delridge 1 (26th) Station southwest of SW Andover Street and 26th Avenue SW and SW Yancy Street. Alternative 6.2 (West Seattle II): Horizontal dual beams departing the bridge at Delridge Way SW south of the Nucor Steel plant and climbing west to SW Avalon Way with Delridge 2 (Andover) Station southwest of SW Andover Street and 26th Avenue SW.

Table 3-1. Summary of Green Line Alignment Alternatives (continued)

Segment 6: West Seattle	<i>See Figure 3-10 for an area depiction and pages 3-38 to 3-41 for more detail. Alternatives in the West Seattle Segment are arranged in subsegments to facilitate comparison of impacts for the specific choices to be made in each area. These alternatives have been numbered to correspond with full-length alignments through West Seattle, but they do not preclude other combinations.</i>
Delridge Subsegment (from Delridge Way SW to Avalon Way SW) (continued)	Alternative 6.3(s) (Delridge North single beam): A single beam traveling along the south side of the West Seattle Bridge from Pigeon Point to SW Avalon Way with Delridge 3 (Nucor) Station south of SW Spokane Street west of Delridge Way SW. Alternative 6.4 (Andover/Yancy): Horizontal dual beams crossing diagonally between SW Andover Street and SW Yancy Street with Delridge 1A (26th) Station east of Longfellow Creek. Alternative 6.4(s) (Andover/Yancy single beam): A single beam crossing diagonally between SW Andover Street and SW Yancy Street with no station in the Delridge area and switches to facilitate the transition between single and dual beam. Alternative 6.5 (Genesee): Horizontal dual beams continuing south along the west side of Delridge Way SW, turning west to follow the south side of SW Genesee Street, and then turning to follow the center left turn lane of SW Avalon Way with Delridge 4 (Genesee) Station near the intersection of Delridge Way SW and SW Genesee Street.
Avalon Subsegment	Five alignment choices are evaluated in the Avalon area. Alternative 6.1(West Seattle I): Horizontal dual beams traveling along the center left turn lane of SW Avalon Way to an Avalon 1 (Center) Station, with two alternative alignments along Fauntleroy Way SW: • Alternative 6.1.3 on the northwest side of Fauntleroy Way SW • Alternative 6.1.4 on the southeast side of Fauntleroy Way SW Alternative 6.2 (West Seattle II): Horizontal dual beams traveling along the center left turn lane of SW Avalon Way to 35th Avenue SW and then to SW Alaska Street in three alternative alignments: the original 6.2 route on the east side of 35th Avenue SW and the center lane of SW Alaska Street, or • Alternative 6.2.1 on the east side of 35th Avenue SW (with Avalon2A (35th) Station) and north side of SW Alaska Street • Alternative 6.2.2 in the center of 35th Avenue SW (with Avalon 2B (35th) Station) and the north side of SW Alaska Street.
Alaska Junction Subsegment	Two alignment choices are evaluated in the Alaska Junction area Alternative 6.1 (West Seattle I): Horizontal dual beam guideways would turn south at 42nd Avenue SW and transition to a vertical configuration to Alaska Junction 1 or 1A (42nd/Edmunds) Station on the west side of 42nd Avenue SW, then would cross southwest near SW Edmunds Street to California Avenue SW. Alternative 6.2 (West Seattle II): Horizontal dual beam guideways would travel along SW Alaska Street to Alaska Junction 2 (44th/California) Station at 44th Avenue SW, turn south along the east side of 44th Avenue SW then to California SW.

Table 3-1. Summary of Green Line Alignment Alternatives (continued)

Segment 6: West Seattle	<i>See Figure 3-10 for an area depiction and pages 3-38 to 3-41 for more detail. Alternatives in the West Seattle Segment are arranged in subsegments to facilitate comparison of impacts for the specific choices to be made in each area. These alternatives have been numbered to correspond with full-length alignments through West Seattle, but they do not preclude other combinations.</i>
California/Morgan Junction Subsegment	Four alignment choices are evaluated along California Avenue SW. Alternative 6.1 (West Seattle I): Horizontal dual beams traveling along the center of California Avenue SW to the Morgan Junction 1 or 1A (West) Station. Alternative 6.1.6 (West of California): Horizontal dual beams traveling along the west side parking lane along California Avenue SW, to the Morgan Junction 1A (West) Station. Alternative 6.1.6(s) (West of California single beam): Single beam traveling along the west side parking lane along California Avenue SW with switches near SW Edmunds Street and the Morgan Junction 1A (West) Station Alternative 6.2 (West Seattle II): Horizontal dual beams traveling along the east side of California Avenue SW to the Morgan Junction 2 (Center) Station.
West Seattle Preferred Alternative	The Preferred Alternative for West Seattle combines a number of the alignment alternatives discussed above as follows: • Duwamish Crossing: Single beam configuration over the West Seattle Bridge departing past Pigeon Point (Alternative 6.1.1(s)) • Delridge: Single beam configuration north of the steel plant to SW Avalon Way (Alternative 6.3(s)) • Avalon: Horizontal dual beam configuration in the center of 35th Avenue SW and the north side of SW Alaska Street (Alternative 6.2.2) • Alaska Junction: Along the west side of 42nd Avenue SW and then to California Avenue SW near SW Edmunds Street (Alternative 6.1) • California/Morgan Junction: Single beam configuration along the west side of California Avenue SW (Alternative 6.1.6(s)) The stations are Delridge 3 (Nucor), Avalon 2B (35th), Alaska Junction 1 (42nd/Edmunds), and Morgan Junction 1A (West).

Table 3-2. Summary of Green Line Station Alternatives

Name	Location	Proposed Station Type	Alignment Alternatives
Segment 1: Ballard			
<i>See Figure 3-6 for an area depiction and pages 3-26 to 3-29 for more detail.</i>			
Crown Hill 1 (West, 85 th)	Southwest of 15 th Avenue NW and NW 85 th Street	Vertical station; on-street bus zones	1.1
Crown Hill 1A (West, 85 th)	Southwest of 15 th Avenue NW and NW 85 th Street	Terminus station; Single platform; on-street bus zones	1.1, 1.1(s), PA
Crown Hill 2 (Center)	North of NW 83 rd Street in the center of 15 th Avenue NW	Side platform with mezzanine; on street bus zones	1.2
NW 65 th 1 (West)	Southwest of 15 th Avenue NW and NW 65 th Street	Center platform; on-street bus zones	1.1
NW 65 th 1A (West)	Southwest of 15 th Avenue NW and NW 65 th Street	Vertical station; on-street bus zones	1.1
NW 65 th 1B (West)	Southwest of 15 th Avenue NW and NW 65 th Street	Side platform station; traction power substation; on-street bus zones	1.1(s), PA
NW 65 th 2 (Center)	Southwest of 15 th Avenue NW and NW 67 th Street	Side platform station with mezzanine; on-street bus zones	1.2
NW Market 1 (Southwest)	Southwest of 15 th Avenue NW and NW Market Street	Vertical station; on-street bus zones with potential off-street bus layover facilities	1.1
NW Market 2 (Center)	South of 15 th Avenue NW and NW Market Street, with structures on both east and west sides of 15 th	Side platform station with mezzanine; on-street bus zones with potential off-street layover facilities	1.2
NW Market 3 (Northwest)	Northwest of 15 th Avenue NW and NW Market Street	Vertical station; on-street bus zones	1.1
NW Market 3A (Northwest)	Northwest of 15 th Avenue NW and NW Market Street	Vertical station; on-street bus zones; on-site construction staging/potential bus layover	1.1(s), PA
Segment 2: Interbay/Magnolia			
<i>See Figure 3-7 for an area depiction and pages 3-29 to 3-30 for more detail.</i>			
Dravus 1 (16 th)	Northwest of 16 th Avenue W and W Dravus Street	Vertical station; on-street bus zones with potential off-street bus layover facilities	2.1
Dravus 1A (16 th)	Northwest of 16 th Avenue W and W Dravus Street	Vertical station; on-street bus zones with off-street bus layover facilities	2.1
Dravus 1B (Barrett)	16 th Avenue W, mid-block between W Barrett Street and W Dravus Street	Side platform station with mezzanine; on-street bus zones	2.1, PA
Dravus 2 (15 th)	Northwest of 15 th Avenue W and W Dravus Street	Vertical station; on-street bus zones	2.2
Howe 1 (West)	West of 15 th Avenue W between W Howe and W Newton Streets (would not align with Interbay Operations Center)	Vertical station; on-street bus zones	2.1
Howe 1A (Blaine)	West of 15 th Avenue W between W Howe and Blaine Street (could align with Interbay Operations Center)	Side platform station; on-street bus zones	2.1 (PA future)

Table 3-2. Summary of Green Line Station Alternatives (continued)

Name	Location	Proposed Station Type	Alignment Alternatives
Howe 2 (Center)	East of 15 th Avenue W between W Howe and W Newton Streets	Side platform station with mezzanine; on-street bus zones	2.2
Prospect 3 (West)	Southwest of 15 th Avenue W and W Prospect Street	Vertical station; on-street bus zones with potential off-street bus turnaround lane	2.2
Elliott and Mercer 1 (Center)	Center of Elliott Avenue W, just south of W Mercer Street	Side platform station with mezzanine; pedestrian bridge; on-street bus zones	2.1
Elliott and Mercer 1A (Center)	East side of Elliott Avenue W between W Mercer and W Republican Streets	Vertical station, on-street bus zones	2.1, PA
Elliott and Mercer 2 (West)	West of Elliott Avenue W across from triangle parcel bound by W Mercer Street, Sixth Avenue W, and Elliott Avenue W	Center platform station; on-street bus zones	2.2
Segment 3: Queen Anne/Seattle Center/Belltown <i>See Figure 3-8 for an area depiction and pages 3-30 to 3-33 for more detail.</i>			
Seattle Center/Queen Anne 1 (North)	At Northwest Rooms of Seattle Center, southeast of First Avenue N and Republican Street and northwest of Key Arena	Side platform station; on-street bus zones	3.1, 3.2
Seattle Center/Queen Anne 1A (North)	At Northwest Rooms of Seattle Center, southeast of First Avenue N and Republican Street and northwest of Key Arena	Center platform station with mezzanine; on-street bus zones	3.1, 3.2, PA
Seattle Center/Queen Anne 2 (South)	Northeast of First Avenue N and Thomas Street, southeast of Key Arena	Side platform station; on-street bus zones	3.3, 3.5
Seattle Center/Fifth and Broad 1	North and south sides of John Street on the east side of Fifth Avenue N	Vertical station; potential for two sets of platforms for event crowds; guideway turnback; on-street bus zones	3.1, 3.3
Seattle Center/Fifth and Broad 1A	West side and over Fifth Avenue N, north side of John Street	Event/Turnback station with two side platforms, Downtown Turnback switches; on-street bus zones	3.1, 3.2, 3.3, PA
Seattle Center/Fifth and Broad 2 (Harrison)	East side of Fifth Avenue N between Broad and Harrison Streets	Vertical station; potential for two sets of platforms; guideway turnback	3.2
Denny 3	On Denny Way between Fourth Avenue and Broad Street	Vertical station; on-street bus zones	3.5
Belltown 1 (Center-West)	West side of Fifth Avenue, at the north end of the block between Bell and Blanchard Streets.	Vertical; on-street bus zones	3.1, 3.2, 3.3, 3.5
Belltown 1A (Center-West)	West side of Fifth Avenue, at the north end of the block between Bell and Blanchard Streets with a reduced station building footprint.	Vertical station; on-street bus zones.	3.1, 3.2, 3.3, 3.5, PA
Belltown 2 (Center-East)	East side of Fifth Avenue, at the north end of the block between Bell and Blanchard Streets	Vertical station; on-street bus zones	3.1, 3.3, 3.5

Table 3-2. Summary of Green Line Station Alternatives (continued)

Name	Location	Proposed Station Type	Alignment Alternatives
Belltown 3 (West)	West side of Fifth, in the center of the block between Bell and Blanchard Streets	Vertical station	3.2
Segment 4: Downtown/Pioneer Square			
<i>See Figure 3-8 for an area depiction and pages 3-33 to 3-36 for more detail.</i>			
Fifth and Stewart 1 (Northwest)	Northwest of Fifth Avenue and Stewart Street	Vertical station; proposed elevated walkway	4.1.1
Fifth and Stewart 1A (West)	Over Fifth Avenue between Stewart and Virginia Streets, southern corner	Vertical station with elevated walkway.	4.1.2
Fifth and Stewart 2 (Virginia)	West side of Fifth Avenue, mid-block between Virginia and Stewart Streets	Center platform station with mezzanine; proposed elevated walkway	4.1, 4.3
Fifth and Stewart 2A (Virginia Center)	West side of Fifth Avenue between Stewart and Virginia Streets, northern corner	Vertical station with mezzanine; elevated walkway	4.1.2, PA
Fifth and Stewart 3 (Lenora)	West side of Fifth Avenue between Lenora and Virginia Streets	Vertical station	4.2, 4.4
Pike 1 (West) A	West side of Second Avenue at the corner of Pike Street and Second Avenue and extending west to the alley	Vertical station	4.1
Pike 1 (West) B	West side of Second Avenue midblock between Pike and Pine Streets	Vertical station.	4.1, PA
Pike 2 (East)	East side of Second Avenue, between Pike and Union Streets on the north end of the block	Vertical station; on-street bus zones	4.2
Pike 2A (East Center)	East side of Second Avenue, between Pine and Union Streets on the northern corner of the block	Vertical station extended platform; on-street bus zones	4.4
Pike 3 (Center)	Center of Second Avenue between Pike and Pine Streets on the south half of the block	Side platform station with mezzanine	4.3
Madison 1 (West)	West side of Second Avenue between Spring and Madison Streets	Vertical station	4.1, PA
Madison 2 (East)	East side of Second Avenue between Marion and Madison Streets	Vertical station; on-street bus zones	4.2
Madison 2A (East Center)	East side of Second Avenue between Marion and Madison Streets	Vertical station, with extended platform; on-street bus zones	4.4
Madison 3 (Center)	Center of Second Avenue between Marion and Madison Streets	Side platform station with mezzanine	4.3
Yesler 1 (West)	West side of Second Avenue between James Street and Yesler Way at site of Sinking Ship Garage	Vertical station	4.1, 4.2, 4.4, PA
Yesler 2 (Center)	Center of Second Avenue between James Street and Yesler Way adjacent to Sinking Ship Garage	Side platform station with mezzanine	4.3

Table 3-2. Summary of Green Line Station Alternatives (continued)

Name	Location	Proposed Station Type	Alignment Alternatives
Segment 5: SODO/Chinatown International District/Pioneer Square			
<i>See Figure 3-9 for an area depiction and pages 3-36 to 3-38 for more detail.</i>			
Weller/King Street 1 (Standard)	West end of Weller Street pedestrian overpass, south of King Street Station, east of Seahawks Stadium's north parking lot	Side platform station with mezzanine	5.1
Weller/King Street 2 (Event)	An event station south of the west end of the Weller Street pedestrian overpass	Side platform station Event station	5.2, 5.2(s), PA
Safeco Field 1	Between S Royal Brougham Way and S Atlantic Street, and between Third and Fourth Avenues S	Event station with potential double platforms for managing event crowds	5.1, 5.2(s), PA
Lander 1 (Northeast)	Between First and Occidental Avenues S and S Lander Street	Side platform station; on street bus zones with potential off-street bus layover facilities	5.1
Lander 2 (Southwest)	Southwest of S Lander Street and First Avenue S	Side platform station with mezzanine; on-street bus zone with off-street bus layover facilities	5.1
Lander 3 (Diagonal)	Between First and Occidental Avenues S, north of S Lander Street.	Side platform station, off-street bus layover facilities, construction staging area.	5.2, 5.2(s), PA
Lander 4 (Utah)	West side of Utah Avenue, south of S Lander Street, by Home Depot	Side platform station with mezzanine; on-street bus zones	5.1
Segment 6: West Seattle			
<i>See Figure 3-9 for an area depiction and pages 3-38 to 3-41 for more detail.</i>			
Delridge 1 (26 th)	Southwest of SW Andover Street and 26 th Avenue SW and SW Yancy Street.	Center platform station; on street bus zone with off-street bus layover facilities	6.1
Delridge 1A (26 th)	Southwest of SW Andover Street and 26 th Avenue SW and SW Yancy Street.	Side platform station; on-street bus zone with off-street bus layover facilities.	6.4,
Delridge 2 (Andover)	Southwest of SW Andover Street and 26 th Avenue SW	Side platform station with mezzanine; on street bus zones with potential off-street bus layover facilities	6.2
Delridge 3 (Nucor)	South of SW Spokane Street, west of Delridge Way SW.	Side platform station	6.3(s), PA
Delridge 4 (Genesee)	On west side of Delridge Way SW, south of SW Andover Street	Side platform station	6.5
Avalon 1 (Center)	Between 35 th and 36 th Avenues SW, station northwest of SW Avalon Way and 35 th Avenue SW	Side platform station with mezzanine; on-street bus zones	6.1
Avalon 2A (35 th)	East side of 35 th Avenue SW just south of SW Oregon Street.	Center platform station; on-street bus zones	6.2, 6.2.1
Avalon 2B (35 th)	West side of 35 th Avenue SW near SW Oregon Street.	Side platform station; on street bus zones	6.2.2, PA

Table 3-2. Summary of Green Line Station Alternatives (continued)

Name	Location	Proposed Station Type	Alignment Alternatives
Alaska Junction 1 (42 nd /Edmunds)	Mid-block, west of 42 nd Avenue SW between SW Alaska and SW Edmunds Streets.	Vertical station; on-street bus zones.	6.1, PA
Alaska Junction 1A (42 nd /Edmunds)	Mid-block, west of 42 nd Avenue SW between SW Alaska and SW Edmunds Streets.	Side platform station; on-street bus zones.	6.1
Alaska Junction 2 (44 th /California)	Mid-block, east of 44 th Avenue SW between SW Alaska and SW Edmunds Streets	Side platform with mezzanine; on-street bus zones	6.2
Morgan Junction 1 (West)	West side of California Avenue SW, northwest of SW Beveridge Place.	Vertical station; on-street bus zones.	6.1
Morgan Junction 1A (West)	West side of California Avenue SW, northwest of SW Beveridge Place.	Terminus station with a single platform; on-street bus zones.	6.1, 6.1.6, PA
Morgan Junction 2 (Center)	Mid-block between SW Holly Street and Fauntleroy Way SW, in the center of California Avenue SW	Side platform station with mezzanine; on-street bus zones	6.2

Note: Most station locations have existing on-street bus zones nearby; potential new or relocated on-street or off-street facilities are specifically noted above by alternative. Where bus zones are not noted, adequate bus zones currently exist nearby and no change is anticipated.

3.8.1.1 Alternative 1.1 - West Side of 15th

In this alternative, the Green Line begins with a horizontal, dual beam configuration on the west side of 15th Avenue NW and 85th Street at the Crown Hill station, with columns typically placed within the existing parking lane of the street, which is currently used as a southbound travel lane north of NW 65th Street during the morning peak period. Following comments received on the Draft EIS, SMP refined this alternative to locate guideway columns slightly more to the east to ensure adequate clearances between the Green Line and nearby buildings.

- As the Green Line approaches the Lake Washington Ship Canal (near NW Leary Way), the alignment would shift west of 15th Avenue NW. It would then cross over the Ballard waterfront area to climb to a new, monorail-only bridge structure over the Ship Canal west of the existing Ballard Bridge.

The station alternatives evaluated with Alternative 1.1 include:

- **Crown Hill 1 (West, 85th).** This vertical station would be located on the southwest corner of NW 85th Street and 15th Avenue NW, with on-street bus zones. Double crossover or switching tracks could be located near NW 82nd Street, south of the station.
- **Crown Hill 1A (West, 85th).** This station would be a single platform terminus elevator station on the same site as Crown Hill 1. The platform would load passengers and serve the southbound guideway on a west side alignment. Trains approaching northbound would use a switch located near NW 83rd Street to cross to this guideway to unload passengers. A storage track would be located just north of the switch. The station site would be served by on-street bus zones.
- **NW 65th 1 (West).** This center platform station would be on the southwest corner of the NW 65th Street and 15th Avenue NW intersection, and would have on-street bus zones.
- **NW 65th 1A (West)** would be a vertically arranged station located on the southwest corner of NW 65th Street and 15th Avenue NW.

- **NW Market.** South and north options are considered for this west-side station at NW Market Street and 15th Avenue NW:
 - **NW Market 1 (Southwest).** This vertical station would be located at the southwest corner of the NW Market Street and 15th Avenue NW. This station includes design options with bus layover facilities on-site (Option A), or on nearby streets, including 14th Avenue NW (Option B).
 - **NW Market 3 (Northwest).** This vertical station would be on the northwest corner of the NW Market Street and 15th Avenue NW, with on-street bus zones.

3.8.1.2 Alternative 1.1(s) - West Side of 15th with single beam

Alternative 1.1(s) evaluates a single beam configuration along 15th Avenue NW. With a single beam option, there would be dual beams at the Crown Hill station: a west guideway beam would serve the station, and an east guideway beam would serve as a storage track. There would be a switch mechanism located near NW 83rd Avenue. From this switch, a single beam would run south along the west side of 15th Avenue NW to a switch structure north of NW 65th Street. Dual side-by-side guideway beams would serve the NW 65th Street station, and then would transition back to a single beam configuration at a switch located north of NW 63rd Street. A single beam would run south to a switch just south of NW 57th Street, where the guideway would transition to a dual beam vertical, iris configuration to serve the Market Street station. The guideway would transition back to a dual horizontal configuration near NW 53rd Street.

Stations evaluated for Alternative 1.1(s) include:

- **Crown Hill 1A (West, 85th).** This station would be a single platform terminus elevator station on the same site as Crown Hill 1. The platform would load passengers and serve the southbound guideway on a west side alignment. Trains approaching northbound would use a switch located near NW 83rd Street to cross to this guideway to unload passengers. A storage track would be located just north of the switch. The station site would be served by on-street bus zones.
- **NW 65th 1B (West)** would be a side platform station located at the southwest corner of NW 65th Street and 15th Avenue NW with a traction power substation integrated within the structure.
- **NW Market 3A (Northwest).** This station would be located on the northwest corner of NW Market Street and 15th Avenue NW. It would feature a vertical station with on-street bus zones. It would consolidate construction staging near the station, requiring three additional parcels of land to the west of the station site and fronting the north side of NW Market Street.

3.8.1.3 Alternative 1.2 - Center of 15th

This alignment alternative would travel south along the center of 15th Avenue NW from the northern terminus of the Green Line to south of NW Market Street, with guideway columns placed in the existing continuous center turn lane. Mid-block left turns could be eliminated, and mid-block driveway access could become right turn only, although left turn pockets are anticipated to be maintained at most major intersections. As the Green Line approaches the Lake Washington Ship Canal and the Ballard Bridge (beginning at about NW 51st Street), the alignment would transition to the east of 15th Avenue NW, crossing over the western portion of several blocks in the north industrial area, and rising to a new, monorail-only bridge structure over the Ship Canal, east of the existing Ballard Bridge (see below).

The station alternatives for Alternative 1.2 are:

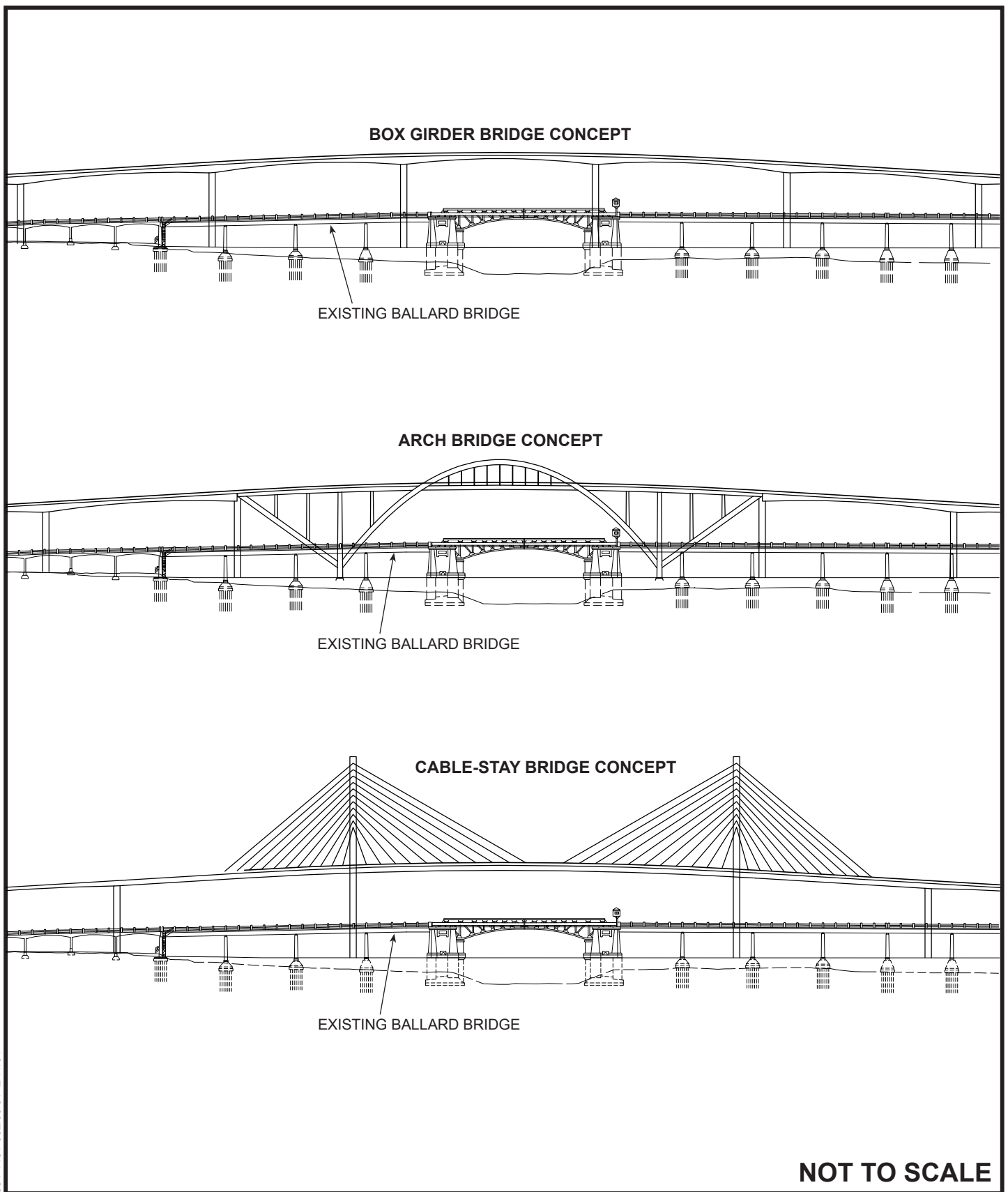
- **Crown Hill 2 (Center).** This side platform station would be located north of NW 83rd Street in the center of the street, with a supporting structure and mezzanine spanning 15th Avenue NW. On-street bus zones would be nearby. A single crossover to approximately 400 feet of tail track could be constructed to the north of the station site, or a double crossover could be constructed to the south.
- **NW 65th 2 (Center).** Located south of NW 67th Street in the center of 15th Avenue NW, this side platform station would include a mezzanine over 15th Avenue NW and station access on the east and west sides of the street, near on-street bus zones.
- **NW Market 2 (Center).** Located south of the NW Market Street and 15th Avenue NW intersection, this side platform station would have a mezzanine over 15th Avenue NW to provide access from the east and west sides of the street. This station alternative includes design options with bus layover facilities on property to the west of 15th Avenue NW (Option A), or on nearby streets, including 14th Avenue NW (Option B).

3.8.1.4 Ballard Crossing

To cross the Lake Washington Ship Canal, the Green Line will feature a new, monorail-only bridge. The bridge would be designed to provide necessary vertical clearance above the Ship Canal's navigational channel for the reasonable needs of marine navigation, which would require a clearance of up to 125 feet, although a lower clearance (120 feet or above) is possible. The clearance required for the new bridge will be determined with the U. S. Coast Guard.

Four alternatives for the bridge are evaluated, as well as several structural design options, all involving the placement of in-water piers outside of the navigational channel. The structural design options under consideration are shown in Figure 3-11. Any of these bridge alternatives could be used with a dual beam or single beam west side alignment; it is most likely that an east bridge would correspond to a center of street alignment, while one of the west bridge alignments would correspond to a west side of street alignment.

- **Alternative 1.1.1 (West Bridge).** This bridge would be located just west of the existing Ballard Bridge. A box girder bridge structure (Design A), cable-stayed bridge (Design B), and arch bridge (Design C) structures are evaluated. The box girder (A) would have the lowest profile with a high point of about 150 feet above the water, while a cable-stayed bridge (B) could be up to 390 feet high, and an arch bridge (C) could be up to 185 feet high. However, the minimal vertical clearance provided for navigation by all three bridges would be the same. The box girder bridge studied would consist of a three-span superstructure with spans at 250, 410, and 250 feet apart. The remainder of the "bridge" length would be composed of spans up to 165 feet apart. This main span and flanking spans of the bridge would be box girder, and the remaining spans would be modified guideway beams. The structure would be approximately 30 feet wide.
- **Alternative 1.1.1(s) (West single beam Bridge).** A single beam configuration is being studied for the West Bridge box girder alternative. It would consist of a three-span superstructure with spans at 250, 410, and 250 feet apart. The remainder of the "bridge" length would be composed of spans up to 165 feet apart. This main span and flanking spans of the bridge would be a box girder, and the remaining spans would be modified guideway beams. The vertical profile of the box girder portions of this bridge would be identical to that of Option 1.1.1 with a box girder structure. However, since only a single beam would be supported, the width of the box girder structure could be reduced by approximately 10 to 15 feet. It is expected that the number of in-water columns would be approximately the same as for Alternative 1.1.1.



**Figure 3-11
Bridge Design
Concept Options**

- **Alternative 1.1.2 (Far West Bridge).** This bridge alignment would curve southwest over the boat turning basin for a navigational channel crossing up to 200 feet west of the existing Ballard Bridge, before turning southeast. All three structural design types (A, B, and C) are considered with this location option.
- **Alternative 1.2 (East Bridge).** This bridge alternative could be constructed as a box girder, arch, or cable-stayed structure. As noted above, it would be located east of the existing Ballard Bridge.

3.8.1.5 Preferred Alternative: Ballard Segment

The Preferred Alternative for this EIS in the Ballard Segment would use the **Alternative 1.1(s)** alignment along the west side of 15th Avenue NW in a single beam configuration. The alignment would begin at a station in the Crown Hill neighborhood.

- The **Crown Hill 1A (West, 85th)** station would be a single platform terminus station on the southwest corner of NW 85th Street and 15th Avenue NW. The platform would load passengers and serve the southbound guideway on a west side alignment. Trains approaching northbound would use a switch located near NW 83rd Street to cross to this guideway to unload passengers. A storage track would be located just north of the switch. The station site would be served by on-street bus zones (see Figure 3-12, p.3-69).

The switch noted above located near NW 83rd Street would facilitate a transition to a single beam configuration. A switch located north of NW 65th Street would provide a transition back to a horizontal dual beam passing area to serve a station near NW 65th Street.

- The **NW 65th 1B (West)** would be on the southwest corner of the NW 65th Street and 15th Avenue NW intersection, and would have on-street bus zones. It would be a side platform elevator station with a traction power substation integrated within the structure (see Figure 3-13, p.3-70).

A switch located south of the station would facilitate a transition back to a single beam configuration, with a switch located north of NW Market Street providing a transition back to a horizontal dual beam configuration. The guideway beams would transition in and out of a vertical, Iris structure arrangement to serve the vertically arranged station at NW Market Street.

- The **NW Market 3 (Northwest)** would be a vertical station located on the northwest corner of NW Market Street and 15th Avenue NW, with on-street bus zones. Construction staging would be consolidated near the station, requiring three additional parcels of land to the west of the station site and fronting the north side of NW Market Street (see Figure 3-14, p.3-71).

After the station at NW Market Street, the alignment would continue south in a horizontal dual beam configuration to the **Alternative 1.1.1 West Bridge Ballard Crossing**. This bridge would be located just west of the existing Ballard Bridge. A modified box girder structure would be used.

3.8.2 Interbay/Magnolia Segment

Several different alignment alternatives are evaluated for the Interbay Segment, which extends from south of the Ship Canal to W Harrison Street along 15th Avenue W and Elliott Avenue W. Up to three stations could be provided within the segment, including at W Dravus Street, at W Howe or W Prospect Streets, and near W Mercer Street.

3.8.2.1 *Alternative 2.1 - West Side of 15th/Center of Elliott*

Descending from the Ballard Crossing, the Green Line would cross over the Port of Seattle Fishermen's Terminal property in the south waterfront industrial area fronting the Ship Canal, with two subroutes available to connect with the new, monorail-only bridge. **Alternative 2.1.1, West Bridge Connection**, would be between 50 and 120 feet west of the Ballard Bridge and cross over several existing buildings, a Burlington Northern Railroad spur line, W Emerson Street, and the loop ramp to the Nickerson/Emerson overpass of 15th Avenue W to align with the west side of 16th Avenue W. **Alternative 2.1.2, Far West Bridge**, would be further west, crossing over Dock #4 and several smaller buildings further to the west before aligning with the west side of 16th Avenue W. The alignment would follow 16th Avenue W to a station at W Dravus Street. After departing the Dravus station, the Green Line would move to the west side of 15th Avenue W up to the W Garfield Street overpass.

An alternative for an Operations Center is located to the west of 15th Avenue W. In order to connect the Interbay Operations Center to the main guideway, two switches and a double crossover (two crossover tracks) would be required. These would be located along 15th Avenue W just south of the intersection with Armory Way. One of the crossovers could also be located just north of the intersection.

In order to maintain required operational clearances between the monorail and nearby properties, the alternative would modify roadway lane and sidewalk dimensions (discussed in more detail in Section 4.1, Transportation.) In addition, a bent structure may be required for the W Howe Street station option at Blaine. If this is the case, the bent structure would touch down on the west side of the street as well as in the center turn lane. The area used for the center turn lane in the typical section would instead be continuous median in the station vicinity.

The alignment would then rise to cross over the W Garfield Street overpass of the Magnolia Bridge. After W Garfield Street, the Green Line would continue south along the center of Elliott Avenue W to W Harrison Street, occupying the existing center turn lanes on Elliott Avenue W. With the guideways in the center of Elliott Avenue W, driveway and minor side street access to and from Elliott Avenue W could be restricted to right turns only.

The station alternatives considered with Alternative 2.1 include:

- **Dravus 1 (16th).** This vertical station would be located at the northwest corner of W Dravus Street and 16th Avenue W, extending out to the guideway in the center of 16th Avenue W. The station would have bus layover facilities on 16th Avenue W and on W Dravus Street (Option A), or on-site (Option B). Double crossover tracks could be located a block north near W. Bertona Street.
- **Dravus 1A (16th).** This alternative would feature a vertical station, which would be located at the northwest corner of W Dravus Street and 16th Avenue W, but would occupy a narrow footprint along 16th Avenue W to minimize property needs. Additional properties along W Dravus Street and 17th Avenue W. would be required for construction staging, contractor parking, and parking loss mitigation.
- **Dravus 1B (Barrett).** This side platform station would be located between 16th Avenue W and 15th Avenue W, mid-block between W Barrett Street and W Dravus Street. The station would follow the diagonal routing of the guideway as it crosses southeast from 16th Avenue W and W Dravus Street to align with 15th Avenue W.
- **Howe 1 (West).** This vertical station would be located southwest of the W Howe Street and 15th Avenue W intersection between W Howe and W Newton Streets. The station would include on-street bus zones. Full construction and operation of the station could be deferred until after the

opening of the Green Line, but the station is evaluated in this EIS as a candidate for immediate construction and operation. This station location would not be compatible with the Interbay Operations Center alternative.

- **Howe 1A (Blaine).** This side platform station would be centered just south of W Blaine Street west of 15th Avenue W between W Howe and W Blaine Streets. The station would include on-street bus zones. This station may require bent structures in the center turn lane of the traffic section. In order to maximize potential ridership the station building could be sited to allow access from both 15th and 16th Avenues W.
- **Elliott and Mercer 1 (Center).** This side platform station would be located in the center of Elliott Avenue W between W Mercer and W Republican Streets, with station entries on both sides of Elliott Avenue W and a mezzanine across Elliott. The station area would include on-street bus zones. The station may also include a pedestrian bridge over Sixth Avenue W, connecting the east station access point and Elliott station mezzanine to an existing stairway along W Mercer Street.
- **Elliott and Mercer 1A (Center).** This vertical elevator station would be located on the east side of Elliott Avenue W between W Mercer and W Republican Streets, with a station entry on the east side of the street. The platforms would span the east side of Elliott Avenue W to meet vertically arranged guideway beams in the center of the street. A signalized crosswalk directly to the north of the station location could provide pedestrian access to the west side of Elliott Avenue W.

3.8.2.2 Alternative 2.1(s) – West Side of 15th/Center of Elliott with single beam

An alignment along the west side of 16th Avenue W and 15th Avenue W and the center of Elliott Avenue W was studied with a single beam configuration north of the Elliott and Mercer Station. This alignment alternative would feature dual beam passing areas, with switches, at the Dravus and Howe/Blaine stations, and then a switch to facilitate a transition back to a dual beam horizontal configuration north of the Mercer and Elliott station. The alignment would transition in and out of a dual beam vertical configuration to serve the Mercer and Elliott station. This alignment alternative could also include switches to allow for an Interbay Operations Center location west of 15th Avenue W. Stations included in this alternative include:

- **Dravus 1B (Barrett).** This side platform station would be located between 16th Avenue W and 15th Avenue W, mid-block between W Barrett Street and W Dravus Street. The station would follow the diagonal routing of the guideway as it crosses southeast from 16th Avenue W and W Dravus Street to align with 15th Avenue W.
- **Howe 1A (Blaine).** This side platform station would be centered just south of W. Blaine Street west of 15th Avenue W between W Howe and W Blaine Streets. The station would include on-street bus zones. This station may require bent structures in the center turn lane of the traffic section. In order to maximize potential ridership the station building could be sited to allow access from both 15th and 16th Avenues W.
- **Elliott and Mercer 1A (Center).** This vertical station would be located on the east side of Elliott Avenue W between W Mercer and W Republican Streets, with a station entry on the east side of the street. The platforms would span the east side of Elliott Avenue W to meet vertically arranged guideway beams in the center of the street. A signalized crosswalk directly to the north of the station location could provide pedestrian access to the west side of Elliott Avenue W.

3.8.2.3 **Alternative 2.2 - Center of 15th/West Side of Elliott**

After descending from the Ballard Crossing, the Green Line in this alternative would cross over the Nickerson/Emerson interchange before traveling to the west of 15th Avenue W for a Dravus station. The alignment would then return to the center of 15th Avenue W until near W Galer Street, where it would cross over the west side of the W Galer Street overpass. After passing W Galer Street, the alignment would follow the west side of Elliott Avenue W until turning east on W Harrison Street.

The station alternatives evaluated with Alternative 2.2 include:

- **Dravus 2 (15th).** This alternative would include a vertical station on the northwest side of the intersection of W Dravus Street and 15th Avenue W, with a bridge from the station platforms to a station building west of 15th Avenue W. The station would include on-street bus zones.
- **Howe/Prospect.** Two options are considered for a station near the mid-point of this segment, with one option to the north of the W Galer Street overpass, and the other to the south. At most, one would be selected for construction. The options are:
 - **Howe 2 (Center).** This option would include a side platform station in the center of 15th Avenue W, north of W Howe Street, with a mezzanine connecting to a station building and access to the east, and emergency access sited to the west. The station would include on-street bus zones.
 - **Prospect 3 (West).** This option would include a vertical station on the west side of Elliott Avenue W southwest of the intersection with W Prospect Street, with a pedestrian bridge spanning Prospect. The station would include on-street bus zone, and a bus turnaround lane to and from Elliott Avenue W could also be provided around the west side of the station building.
- **Elliott and Mercer 2 (West).** This alternative would include a center platform station to the west of Elliott Avenue W between W Mercer and W Republican Streets. The station would include on-street bus zones.

3.8.2.4 **Preferred Alternative: Interbay/Magnolia Segment**

The Preferred Alternative for this EIS in the Interbay Segment would use the **Alternative 2.1.1** (West Bridge) connection between the Ballard Crossing and an alignment (**Alternative 2.1**) along the west side of 16th Avenue W, west side of 15th Avenue W, and center of Elliott Avenue W in a horizontal dual beam configuration. The guideway beams would transition in and out of a vertical configuration to serve a vertical station at Elliott/Mercer. The guideway would be constructed so as to allow for a future station at Howe/Blaine. The Preferred Alternative would also include the **Interbay Operations Center (C-1)** alternative west of 15th Avenue W and would include necessary switches and crossover tracks to allow monorail trains to reach the Operations Center.

Stations in this segment with the Preferred Alternative would include:

- **Dravus 1B (Barrett).** This side platform station would be located between 16th Avenue W and 15th Avenue W, mid-block between W Barrett Street and W Dravus Street. The station would follow the diagonal routing of the guideway as it crosses southeast from 16th Avenue W and W Dravus Street to align with 15th Avenue W (see Figure 3-15, p.3-72).
- **Future station: Howe 1A (Blaine).** The guideway would be constructed so that a station could be constructed in the future in this area. The future station evaluated is a side platform station that would be centered just south of W. Blaine Street west of 15th Avenue W between W Howe

and W Blaine Streets. The station would include on-street bus zones. This station may require bent structures in the center turn lane of the traffic section, which could be added when the station is constructed. In order to maximize potential ridership the station building could be sited to allow access from both 15th and 16th Avenues W (see Figure 3-16, p.3-73).

- **Elliott and Mercer 1A (Center).** This vertical station would be located on the east side of Elliott Avenue W between W Mercer and W Republican Streets, with a station entry on the east side of the street. The platforms would span the east side of Elliott Avenue W to meet vertically arranged guideway beams in the center of the street. A signalized crosswalk directly to the north of the station location could provide pedestrian access to the west side of Elliott Avenue W (see Figure 3-17, p.3-74).

3.8.3 Queen Anne/Seattle Center/Belltown Segment

Four alignment alternatives are evaluated to serve Queen Anne, Seattle Center, and Belltown and to connect with Downtown Seattle (see Figure 3-8). Up to three stations could be constructed along this segment of the alignment, with one located near lower Queen Anne and west Seattle Center, one at east Seattle Center or Denny, and one in Belltown.

Seattle Center, with its 74 acres, numerous venues, and frequent festivals is an important part of Seattle and would also be a very high ridership area for the Green Line. Some comments received during scoping indicated that Seattle Center's heritage would be enhanced by having the Green Line travel through the Center; while others stated the Green Line should travel around the Center and not enter the grounds. The voter-approved plan left the route decision in this area at Seattle Center between W Harrison Street and Fifth Avenue to be determined. To evaluate these alternatives, SMP worked with a Seattle Center stakeholder group during the first half of 2003 to identify and begin analysis of potential alignment options and to begin to explore potential urban design treatment of Green Line stations and guideways in the vicinity of the Center. SMP selected a design firm to assist with this work and ensure that design principles, consistent with the Seattle Center Master Plan, would inform the selection of an alignment and the design of stations and guideways in the vicinity of Seattle Center. Reflecting the complexity of this area, four separate alignment alternatives—two through the Center and two around the Center—are evaluated in the EIS. A fifth alternative was identified but not carried forward for additional analysis in the EIS.

As with other segments, for ease of analysis the different alignment and station alternatives that were analyzed in the Queen Anne/Seattle Center/Belltown Segment were combined into full-segment combinations. However, because these full-segment alternatives include a number of different possibilities that could be combined in different ways (the alignment along W Harrison Street for Alternative 3.2, for instance, could be combined with the alignment for Alternative 3.1 in the Seattle Center area), they have been described below in sub-segment groupings. Again, four distinct numbered alignment alternatives were developed for analysis and are described as full-segment alternatives in the substantive chapters that follow. But, any of these four alternatives should be understood to include a number of component parts that could be combined in different ways. To illustrate that concept, this description provides a narrative that illustrates how the different components were developed for each section of the segment.

3.8.3.1 Alternative 3.1 - Seattle Center/Republican

W Harrison Street Alignment. Crossing from Elliott Avenue W, the Green Line would travel along the south side of W Harrison Street on horizontally arranged guideways, with columns placed within an existing parking lane. This south side of W Harrison Street alignment could be paired with the alignment for any of the other alternatives evaluated in this segment for the Seattle Center or Fifth Avenue areas.

Seattle Center Area Alignment. To serve the station at the site of the Northwest Rooms northwest of Key Arena, the guideway would pass over First Avenue N and the property to the northwest of the W. Harrison Street/First Avenue N intersection. A design option would raise the profile of the guideways to avoid demolishing an existing apartment building on the corner. The guideways would then continue eastward within the Seattle Center grounds, heading east in line with W Republican Street (called the 'Northwest Route' by the stakeholders' group). The alignment would continue east in the Seattle Center along the path of Republican Street, passing north of the International Fountain green and south of the Mercer Street performing arts buildings. Approaching Memorial Stadium, the alignment would turn southeast through a portion of the property immediately west of Memorial Stadium, past the northwest corner of the Center House, and into the area currently occupied by Fun Forest attractions and the existing monorail station and guideway. Approaching the Experience Music Project (EMP), this alternative includes two alignment options:

- **Alternative 3.1.1 (Through EMP).** This alignment option would generally follow the alignment of the existing Seattle Center monorail guideway through the EMP to the Seattle Center/Fifth and Broad station on Fifth Avenue N.
- **Alternative 3.1.2 (Around EMP).** This alignment option would have one or both guideways curving south of the EMP to the Seattle Center/Fifth and Broad station.

Two station alternatives are considered for the Seattle Center/Fifth and Broad area. This Seattle Center/Fifth and Broad station could be designed to accommodate a connection to a future monorail line, as described in the Seattle Popular Monorail Plan. **Alternative 3.1.4** would travel over the center of Fifth Avenue and serve an event station near Fifth Avenue and Broad Street, requiring straddling structures over the roadway.

Fifth Avenue Alignment. After leaving the station at Fifth and Broad, the guideways would travel in a vertical arrangement past Broad Street and travel along the center of Fifth Avenue to Virginia Street, replacing the existing Seattle Center monorail guideways and columns. Because the two Green Line stations at either side of Seattle Center must serve large crowds for events, the alternative also includes an option to include a switch at Fifth Avenue and Vine Street. The switch would allow trains to cross to and from a train storage track that could extend 300 feet north. The pocket track would allow train storage near the Seattle Center during events.

Alternative 3.1 evaluates the following station alternatives:

- **Seattle Center/Queen Anne 1 (North).** This side platform station would be located on a diagonal near the northwest corner of Key Arena east of First Avenue N in the area currently occupied by the Northwest Rooms. Access points would be from First Avenue N, W Republican Street, and Seattle Center to the east. Although the station would be oriented to a guideway that would cross the site diagonally, the station concept includes a station building that could extend to fill the triangle to First Avenue N and W Republican Streets, providing space that could be occupied by retail/commercial or other uses consistent with the Seattle Center Master Plan.
- **Seattle Center/Queen Anne 1A (North).** This alternative would be located on a diagonal near the northwest corner of Key Arena east of Fifth Avenue N in the area currently occupied by the Northwest Rooms. It would have a center platform layout and have guideway approaches from the west that have been refined to avoid the need to demolish a nearby apartment building.
- **Seattle Center/Fifth and Broad 1.** This alternative includes a vertical station on the southeast side of Fifth Avenue, between Broad Street and Denny Way, straddling John Street, with station buildings and access on the north and south sides of John Street. This station could include Downtown Turnback switches on the east side of the station.

- **Seattle Center/Fifth and Broad 1A (Southeast).** This event/turnback station would be located over Fifth Avenue N between John and Broad Streets. Station access would be off of the existing parking lot bounded by John Street, Broad Street, Fifth Avenue N and the alley parallel to and west of Fifth Avenue N. The station is designed to accommodate a Downtown Turnback. The platform over Fifth Avenue N would be used for northbound trains. A platform over the sidewalk and the existing parking lot would be used for southbound trains. Access to both platforms would be off the existing parking lot with a mezzanine over the southbound track to access the center-of-street platform.
- **Belltown.** Three station site or design options are considered with this alternative:
 - **Belltown 1 (Center-West).** This option would include a vertical station serving center or west of center guideways on Fifth Avenue south of Bell Street, with a station building providing access to the west side of Fifth Avenue. It would feature an on-street bus zone at the south end of the block.
 - **Belltown 1A (Center-West).** This option would be a vertical station on the west side of Fifth Avenue south of Bell Street, with the station house building minimized to reduce property acquisitions. This option could serve center or west of center guideways.
 - **Belltown 2 (Center-East).** This option would include a vertical station serving center guideways on Fifth Avenue south of Bell Street, with a station building located between Bell and Blanchard Streets providing access to the east side of Fifth Avenue. The station would include on-street bus zones.

3.8.3.2 Alternative 3.2 - Mercer

As with Alternative 3.1, described above, this alignment alternative consists of a number of alignment and station alternatives that could be combined in different ways. To make the potential for combination more clear, this alignment is described in three geographic portions, each of which could be combined with other alignment alternatives.

W Harrison Street Alignment. Under this alternative, after crossing from Elliott Avenue W, the Green Line would travel on the north side of W Harrison Street in the existing parking lane.

Seattle Center Area Alignment. As it approaches Queen Anne Avenue N and the Seattle Center, it would curve to the north to a station northwest of Key Arena (with the same station options as Alternative 3.1). After the station, the alignment would continue further north along the west side of Warren Avenue N before turning east along the north side of Mercer Street, which it would follow east toward Fifth Avenue N. One bent structure would be required over Mercer Street at Warren Avenue N. All of the trees on the west side of Warren Avenue N would be replaced. The guideway would have a horizontal dual beam configuration for this entire section. Once on Mercer Street, the guideway would be located just south of the existing curb, and the sidewalk area would be widened. All existing traffic lanes would remain in operation, but two traffic lanes would be 12 feet wide and two traffic lanes would be 11 feet wide. All of the trees on the north side of Mercer Street between Fifth Avenue N and Warren Avenue N would be replaced. Crossing from Mercer Street to turn southeast on Fifth Avenue N, the guideways would require two bent structures at or near the intersection.

After aligning with the east side or to the east of Fifth Avenue N right-of-way (depending on the Seattle Center/Fifth and Broad station option used), the guideways would transition to a horizontal arrangement as the alignment curves southeast to a Fifth and Broad station, located either on the east side of Fifth Avenue N. A revised alignment (**Alternative 3.2.3**) would involve guideways separating to the east and

west sides of Fifth Avenue N., approaching a Fifth and Broad event station on the west side of Fifth Avenue N.

Fifth Avenue Area Alignment. After crossing Broad Street, the alignment would follow the west side of Fifth Avenue to Stewart Street. In response to environmental and engineering findings and comments on the Draft EIS, SMP has refined the alignment in this area to increase the distance between the guideways and buildings on the west side of the street.

The west side alignment along Fifth Avenue would include two design alternatives:

- **Alternative 3.2.1** would remove the columns and guideway beams from the existing Seattle Center monorail.
- **Alternative 3.2.2** would retain the columns and guideway beams from the existing Seattle Center monorail along with the new structures for the Green Line.

The west side alignment would provide two lanes of traffic along Fifth Avenue and a substantially widened sidewalk area with the potential for a bicycle lane.

The station alternatives for Alternative 3.2 are:

- **Seattle Center/Queen Anne 1 (North).** Same as described above for Alternative 3.1.
- **Seattle Center/Fifth and Broad 1A.** Same as described for Alternative 3.1.
- **Seattle Center/Fifth and Broad 2 (Harrison).** This vertical station would be located on the east side of Fifth Avenue N between Broad and Harrison Streets, with the station building and access sited at the south end of the block.
- **Belltown 1 (Center-West).** Same as described above for Alternative 3.1.
- **Belltown 1A (Center-West).** Same as described above for Alternative 3.1.
- **Belltown 3 (West).** This vertical station would have a station building and access to the southwest of the Fifth Avenue/Bell Street intersection.

3.8.3.3 Alternative 3.3 - Thomas

This alternative would be the same as Alternative 3.1 (following the south side of W Harrison Street) until it approaches Queen Anne Avenue N, where it would turn southeast to reach a station near the southwest corner of Key Arena. After the station, this alignment alternative would continue toward Thomas Street, south of Key Arena, and along the path of Thomas Street into the Seattle Center grounds, north of the Seattle Children's Theatre. It would continue on the path south of Fisher Pavilion and the Center House to Fifth Avenue N. The station alternatives for Alternative 3.3 are:

- **Seattle Center/Queen Anne 2 (South).** This station alternative would be a side platform station located near the southwest corner of Key Arena, oriented to guideways crossing diagonally southeast from the intersection of First Avenue N and W Harrison Street. The station concept includes a station building that would extend to fill the triangle to First Avenue N and W Thomas Street, providing space that could be occupied by Seattle Center or related uses. The station would include on-street bus zones.
- **Seattle Center/Fifth and Broad 1 (Southeast).** This alternative would be the same as described above for Alternative 3.1.

- **Belltown 1 or 2.** These station alternatives would be the same as described above for Alternative 3.1.

3.8.3.4 Alternative 3.5 - Second/Denny

The initial part of this alignment alternative would be similar to Alternative 3.3, with the Green Line traveling on the south side of W Harrison Street to reach a station by the southwest corner of the Key Arena. After the station, it would turn south to follow the east side of Second Avenue N to Denny Way, where it would turn east to continue along the south side of Denny Way. The guideways would cross over Denny Way, and the supporting structures needed to accommodate this turn may also fully or partially straddle Second Avenue or Denny Way and their intersection. This alignment would have vertically arranged guideways along the south side of Denny Way to Fifth Avenue, with support columns anticipated to occupy the existing south-side travel lane on Denny Way. After turning south onto Fifth Avenue, the alignment would follow the center of Fifth Avenue, the same as Alternative 3.1.

The station alternatives for Alternative 3.5 are:

- **Seattle Center/Queen Anne 2 (South).** This alternative would be the same as described above for Alternative 3.3.
- **Denny 3.** This alternative would be a vertical station located on the triangular block on the south side of Denny Way, bounded by Fourth Avenue and Clay Street. The station would include on-street bus zones.
- **Belltown 1 or 2.** These station alternatives would be the same as described above for Alternative 3.1.

3.8.3.5 Preferred Alternative: Queen Anne/Seattle Center/Belltown Segment

After detailed traffic and engineering analysis, preliminary cost estimating, travel time calculations, and months of work with community stakeholders and urban designers, as well as extensive comments during the comment period for the Draft EIS, SMP staff designated a through-the-Center route (the “Northwest Route”) for the Preferred Alternative for this EIS. This Preferred Alternative combines several of the alignment alternatives that were evaluated for different areas within this segment as follows:

W Harrison Street Alignment. The Preferred Alternative would use the **Alternative 3.1** alignment along the south side of W Harrison Street.

Seattle Center Area Alignment. The alignment would then serve the **Seattle Center/Queen Anne 1A (North)** station at the Northwest Rooms on the northwest side of Key Arena and would then follow **Alternative 3.1** through the Seattle Center along the path of Republican Street and **Alternative 3.1.1** through the EMP. The alignment would then follow **Alternative 3.1.4** along the center of Fifth Avenue N to the **Seattle Center/Fifth and Broad 1A** event/turnback station with Downtown Turnback switch facilities.

- **Seattle Center/Queen Anne 1A (North).** This alternative would be located on a diagonal near the northwest corner of Key Arena east of Fifth Avenue N in the area currently occupied by the Northwest Rooms. It would have a center platform layout and have guideway approaches from the west that have been refined to avoid the need to demolish a nearby apartment building (see Figure 3-18, p.3-75).
- **Seattle Center/Fifth and Broad 1A.** This event/turnback station would be located over Fifth Avenue N between John and Broad Streets. Station access would be off of the existing parking

lot bounded by John Street, Broad Street, Fifth Avenue N and the alley parallel to and west of Fifth Avenue N. The station is designed to accommodate a Downtown Turnback. The platform over Fifth Avenue N would be used for northbound trains. A platform over the sidewalk and the existing parking lot would be used for southbound trains. Access to both platforms would be off the existing parking lot with a mezzanine over the southbound track to access the center-of-street platform (see Figure 3-19, p.3-76).

Fifth Avenue Alignment. The alignment would then follow **Alternative 3.2.1** along the west side of Fifth Avenue in a horizontal dual beam configuration (removing the columns and guideways from the existing Seattle Center monorail) and transitioning into a vertical configuration to serve the **Belltown 1A (Center-West)** station. The guideways would remain in a vertical configuration until after the Fifth and Stewart Station.

- **Belltown 1A (Center-West).** This alternative would include a vertical station on the west side of Fifth Avenue south of Bell Street, with the station house building minimized to reduce property acquisitions (see Figure 3-20, p.3-77).

3.8.4 Downtown/Pioneer Square Segment

All of the alignment alternatives being evaluated within Downtown Seattle and Pioneer Square would turn from Fifth Avenue and head west along Stewart Street to Second Avenue. The alternatives would then all follow Second Avenue south toward S Jackson Street, near the King Street Station in Pioneer Square. Up to four stations may be constructed in the Downtown Segment, with potential station locations near Fifth Avenue and Stewart Street, and on Second Avenue near Pine or Pike Streets, near Madison or Marion Streets, and near Yesler Way. The main differences between the alternatives involve locations for the stations and the alignment along Second Avenue. Any of the alignment alternatives that were evaluated could be combined with any combination of alignments for Seattle Center or SODO.

3.8.4.1 Alternative 4.1 - West Side of Second

This alternative would turn southwest from Fifth Avenue toward Stewart Street serving a station near the intersection of Fifth Avenue and Stewart Street. Two alignment options have been evaluated in the Fifth and Stewart area. These Fifth and Stewart options could be matched with other alignment alternatives along Second Avenue, but for simplicity's sake are analyzed with Alternative 4.1:

- **Alternative 4.1.1 (Fifth and Stewart (Northwest)):** Would feature a diagonal alignment across the block at the northwest corner of the intersection of Fifth Avenue and Stewart Street.
- **Alternative 4.1.2 (Fifth and Stewart (Virginia)):** Would follow Fifth Avenue until turning west south of the center of Stewart Street.

The alignment would then continue west along Stewart Street toward Second Avenue, where it would turn south to cross over Second Avenue and travel along the west side of the street. Along Stewart Street, the locations of support columns for the guideways could reduce Stewart Street from three travel lanes and a parking lane to two travel lanes with widened sidewalks to the north and south.

The guideways in this alternative have been refined based on comments received in the Draft EIS. Along Second Avenue, to minimize visual impacts, they would transition between a horizontal dual beam configuration between stations and a vertical dual beam configuration at stations to serve three vertical stations.

The alignment's turn from Stewart Street to Second Avenue could require supporting structures that could partially or fully straddle either street. On Second Avenue, support columns for the guideways and

stations are anticipated to be located in the existing western parking and bus lane; the west-side curbs could be extended around the columns. The west-side bus lane would move to the next lane and four travel lanes are anticipated to be maintained on Second Avenue, but the parking lane on the east side would be eliminated. However, a bike lane on the east side would be provided, and on the west side of the street, some on-street parking may be able to be provided between the columns on the west side in locations not requiring bus stops.

The Green Line would remain along the west side of Second Avenue and Second Avenue Extension through Downtown to S Main Street, where it would curve to Third Avenue S to S Jackson Street and then in between King Street Center and King Street Station.

Alternative 4.1 includes the following station alternatives:

- **Fifth and Stewart.** A number of station alternatives are being evaluated at this location:
 - **Fifth and Stewart 1 (Northwest).** This vertical station would be located diagonally within the block northwest of the intersection of Fifth Avenue and Stewart Street. It would correspond with the Alternative 4.1.1 (Northwest) subsegment alternative. This station would also include a suboption to provide an elevated pedestrian walkway connecting to Westlake Center.
 - **Fifth and Stewart 1A (West).** This vertical station would be located over the center of Fifth Avenue between Virginia and Stewart, but the station building would be minimized to reduce acquisitions. It would correspond with the Alternative 4.1.2 (Virginia) subsegment alignment alternative. The station would be accessed from a mezzanine from the parking lot at Fifth Avenue and Stewart Street and extending out under the guideway to the center of Fifth Avenue. From the mezzanine level, stairs, escalators, and/or elevators would be used to access the platforms over the center of Fifth Avenue. An elevated pedestrian walkway to Westlake Center would be provided.
 - **Fifth and Stewart 2 (Virginia).** This station would be a center platform with a mezzanine level. It would be located above the center of Fifth Avenue and would have an entrance from the west on the block between Virginia and Stewart Streets. This station would also include a suboption to provide an elevated pedestrian walkway connecting to Westlake Center.
 - **Fifth and Stewart 2A (Virginia Center).** This vertical station would be on the block northwest of the intersection of Fifth Avenue and Stewart Street, but the station building would be minimized to reduce acquisitions. As with Fifth and Stewart 1 above, it would provide an elevated walkway to Westlake Center. It would correspond with the Alternative 4.1.2 (Virginia) subsegment alignment alternative.
- **Pike 1 (West) Option A.** Under this alternative, a vertical station would be located on property to the west of Second Avenue, between Pine and Pike Streets. This alternative station has two suboptions, with Option A ending at the alley parallel to First and Second Avenues.
- **Pike 1 (West) Option B.** Under this alternative, a vertical station would be located on property to the west of Section Avenue between Pine and Pike Streets.
- **Madison 1 (West).** This vertical station would be located on the west side of Second Avenue, between Madison and Spring Streets, on the site of the Federal Reserve Building.
- **Yesler 1 (West).** Under this alternative, a vertical station would be located on the triangular block to the west side of Second Avenue at Yesler Way.

The EIS alignments for Second Avenue responded to a number of factors including the number of historic resources along that street, the desire to avoid significant impacts to the major utilities (electrical duct banks, sewer line, and water main), the desire to maintain three general purpose travel lanes, the difficulty of relocating the existing bike lane, and community urban design concerns, in particular the competing concerns of reducing the bulkiness of structures in the right-of-way while maintaining appropriate design clearances from buildings.

In addition to Alternative 4.1 (West), three other alternatives are analyzed in detail: Alternative 4.2 (East), Alternative 4.3 (Center) and Alternative 4.4 (East of Center). Alternative 4.1 (West) was selected as the Preferred Alternative for a number of reasons, including better transit connections, less impacts on public spaces, and station proximities to key ridership locations. A number of refinements for a west side alternative, all of which would have locations and impacts within the range of the alternatives studied in detail in the EIS, have also been explored and considered. As mentioned above, one design refinement for Alternative 4.1 (West) would be offsetting guidebeams on columns, which would move trains several feet further into the right-of-way. Though no significant impacts to buildings are anticipated, other than visual impacts to historic buildings, more room between trains and building might be a preferable urban design refinement. The design tradeoff would be larger column size (from the estimated range of four to five feet in diameter to six to six and a half feet in diameter) and larger foundations.

Some commenters suggested removing the bike lane from Second Avenue, and then moving the monorail guideway columns five feet further to the west, thus giving more room between buildings on the west side of Second Avenue. This suggested “five feet further” refinement would locate columns over the main electrical duct bank for this part of downtown. Moving the duct bank would have significant construction impacts because relocation would take many years and would dramatically increase project and community costs. Foundations spanning the duct bank are likely infeasible because of Seattle City Light access needs. Construction impacts for those columns would be similar to Alternative 4.3 (Center). This refinement would remove the bike lane (similar to Alternative 4.3). The bike lane is the only one currently in the downtown area, and would be difficult to relocate.

Another suggested refinement would isolate the bus lane on the west side of Second, and place columns in an undivided median (similar to Alternative 4.4 – East of Center). For operational reasons (the need for room to pass), buses could not be confined to a single lane width. Therefore, this refinement would need to slightly decrease west sidewalk width and locate a bus/passing lane of 20 feet or more on the west side of the street. Monorail columns would be located in an undivided median just to the east of that bus passing lane. Three general purpose lanes could be located in the remainder of Second Avenue. The easternmost of these lanes could be multi-programmable – with option to use for parking, bicycles, or general traffic at different times of the day.

Another refinement would locate the guidebeams further to expand the west sidewalk in order to locate monorail columns just past the eastern edge of the duct bank along Second Avenue. This configuration would entail the loss of a general purpose travel lane and the bike lane southbound on Second Avenue. Relocating the bike lane to the 40-foot wide west sidewalk would be difficult because of conflicts with pedestrians and bus passengers.

3.8.4.2 Alternative 4.2 - East Side of Second with Crossover

This alignment alternative would begin with a station at Lenora Street and Fifth Avenue, then turn west onto Stewart Street. The alignment would then continue west along Stewart Street to Second Avenue, where it would turn south across part of the block southeast of the intersection of Second Avenue and Stewart Street. It would then travel along the east side of Second Avenue from Pike Street to south of

Marion Street and would then cross to the west side of Second Avenue (to avoid an alignment crossing directly in front of Smith Tower at Yesler Way, a historic building listed on the National Register).

Throughout most of the Downtown Segment (from Stewart Street through to Second Avenue at S Washington Street), the guideways in this alternative would be vertically arranged. Along Second Avenue from Pike to Marion Streets, this alternative is anticipated to place columns and extend the curb into the existing eastern lane of Second Avenue, which is currently used for parking and eastbound turning traffic, with an adjacent bike lane. The bike lane would be maintained, and some on-street parking could also be provided between columns in some locations. South of Marion Street, the alignment would cross over Second Avenue and then follow the same west-side alignment as described above for Alternative 4.1. At the Marion Street crossover, the guideway would be supported by structures that could straddle Second Avenue.

Alternative 4.2 includes the following station alternatives:

- **Fifth and Stewart 3 (Lenora).** This alternative would have a vertical station oriented to the west side of Fifth Avenue, between Lenora and Virginia Streets, with the station building providing access to the block west of Fifth Avenue.
- **Pike 2 (East).** This alternative would have a vertical station located on the east side of Second Avenue, between Pine and Pike Streets.
- **Madison 2 (East).** This station alternative would be located on the east side of Second Avenue, between Madison and Marion Streets, at the Wells Fargo Building. The station would be vertical.
- **Yesler 1 (West).** This station alternative would be the same as described above for Alternative 4.1.

3.8.4.3 Alternative 4.3 - Center of Second

Under this alternative, the alignment would begin the same as in Alternative 4.2, but as it turns from Stewart Street, it would travel along the center of Second Avenue, with columns anticipated to be placed in a newly created center median. This could reduce Second Avenue from five lanes to four, potentially eliminating the east side parking and turn lane and the east side bicycle lane, and converting the west side bus and off-peak parking lane to a bus-only lane. The alignment would continue along the center of Second Avenue and Second Avenue Extension to Third Avenue S, which it would follow to S Jackson Street near King Street Station. The guideways for this segment alternative would be horizontally arranged. This EIS also analyzed an option for Alternative 4.3 that would locate the guideways west of the center of Second Avenue. This option could avoid the need for straddle foundations under support columns to avoid the sewer tunnel below the center of Second Avenue.

Alternative 4.3 includes the following station alternatives:

- **Fifth and Stewart 2 (Virginia).** This alternative would be the same as described above for Alternative 4.1.
- **Pike 3 (Center).** This alternative would be a side platform station oriented to guideways in the center of the street, with a mezzanine level over Second Avenue. The station's access building would be located on property to the west of Second Avenue, within the block between Pike and Pine Streets. Supporting structures for the station are anticipated to straddle the street, with support structures anticipated to be placed on the sidewalk to the east and the west.
- **Madison 3 (Center).** This side platform station alternative would be located in the center of Second Avenue, between Madison and Marion Streets. The station would have a mezzanine level

over Second Avenue, and supporting structures are anticipated to straddle the street, requiring the support structure bases and columns placed on the sidewalk to the east.

- **Yesler 2 (Center).** This side platform station would have a mezzanine level to cross from the platforms and guideway above the center of Second Avenue, with access from the west side of Second Avenue. The station access building would be located on the site of the triangular site bounded by Second Avenue and James Street and Yesler Way. Station support structures and the station mezzanine are anticipated to straddle Second Avenue, with support structures placed along the sidewalk to the east and the west.

3.8.4.4 Alternative 4.4 – East of Center

This vertically arranged alignment was developed as a refinement to Alternatives 4.2 and 4.3 to respond to comments received on the Draft EIS. It would begin the same as Alternative 4.3, but upon reaching Second Avenue would position the guideway columns midway between the center and the east side of the street. It would feature a bus/parking lane, two travel lanes to the west, a median around the monorail columns, with a travel lane and a bike lane to the east. This would reduce the need to fully-span the street, compared to a center alignment, and would also avoid conflicts with a major underground utility. Like the east side of Second Avenue alignment alternative, this alternative would cross to the west side of Second Avenue south of Marion Street so as to avoid the Smith Tower, using straddle bents to support the transition across the street. The Pike and Madison stations would be vertical stations located on the east side of the right-of-way with platforms reaching out over the street to meet the guideway beams and supported by columns in the guideway median strip.

Alternative 4.4 evaluates the following station alternatives:

- **Fifth and Stewart 3 (Lenora)** – This alternative would be as described above for Alternative 4.2.
- **Pike 2A (East of Center)** – This alternative would be similar to the station alternative described above for Alternative 4.2. The platforms for this alternative would extend over the east side of the street to meet the east of center guideways.
- **Madison 2A (East of Center)** – This alternative would be similar to the station alternative described above for Alternative 4.2. The platforms for this alternative would extend over the east side of the street to meet the east of center guideways.
- **Yesler 1 (West)** – This is the same station alternative described in Alternative 4.1

3.8.4.5 Preferred Alternative: Downtown/Pioneer Square Segment

The Preferred Alternative for this EIS for the Downtown/Pioneer Square Segment would use the **Alternative 4.1** alignment along the west side of Second Avenue, with the **Alternative 4.1.2** (Virginia) transition from Fifth Avenue that allows for a west of center alignment along Fifth Avenue and an associated station. On Second Avenue, the guideways would travel along the west side of the street, transitioning between a vertical, Iris configuration at stations to a horizontal configuration between stations so as to minimize visual impacts. Stations for the Preferred Alternative would include:

- **Fifth and Stewart 2A (Virginia Center).** This vertical station would be on the block northwest of the intersection of Fifth Avenue and Stewart Street, but the station building would be minimized to reduce acquisitions. It would provide an elevated walkway to Westlake Center. It would correspond with the Alternative 4.1.2 (Virginia) subsegment alignment alternative (see Figure 3-21, p.3-78).

- **Pike 1 (West) Option B.** Under this alternative, a vertical station would be located on property to the west of Section Avenue between Pine and Pike Streets (see Figure 3-22, p.3-79).
- **Madison 1 (West).** This vertical station would be located on the west side of Second Avenue, between Madison and Spring Streets, on the site of the Federal Reserve Building (see Figure 3-23, p.3-80).
- **Yesler 1 (West).** Under this alternative, a vertical station would be located on the triangular block to the west side of Second Avenue at Yesler Way (see Figure 3-24, p.3-81).

3.8.5 SODO/Chinatown International District/Pioneer Square Segment

After its station at Yesler Way, the Green Line will travel to Third Avenue S to serve King Street Station, the Chinatown International District, the Seahawks Stadium, and Safeco Field. The Green Line will then continue south through the SODO industrial area, serving its employment center near S Lander Street and then traveling toward S Horton Street where it will begin its ascent to the West Seattle Bridge (see Figure 3-9). Up to three stations could be constructed in this segment, including stations near King Street Station north of Seahawks Stadium, at Safeco Field, and near S Lander Street.

3.8.5.1 Alternative 5.1 - East Side of Third Avenue/Utah

This alignment alternative would continue past S Jackson Street and cross to the west of the King Street Station, continuing south to a station near the Weller Street pedestrian crossing, which is located adjacent to the existing parking lot north of Seahawks Stadium. After the Weller/King station, the Green Line would curve slightly southeast and feature a bridge structure to cross over mainline railroad tracks and the Fourth Avenue S/I-90 ramps east of the Seahawks Stadium, and then travel along the west side of an existing access road by the railroad, continuing south toward S Royal Brougham Way and Safeco Field. The guideways in this area would be approximately 60 feet above ground to provide adequate clearance over the railroad, the I-90 ramps and the future S Royal Brougham Way overcrossing. For the Final EIS, the alignment has been refined to allow a shorter span for a more perpendicular crossing of the railroad tracks. This alignment alternative would also feature switches south of the Weller/King Street station to provide a southern point for a Downtown Turnback, which would allow monorail trains to maximize operating efficiencies for service between Downtown, Seattle Center and the stadiums. The alternative also maintains existing truck lane access to Seahawk stadium. The Downtown Turnback in this area would include a special pocket track with six switches and a center pocket guideway beam between the main guideway beams as part of the Downtown Turnback.

After crossing over S Royal Brougham Way, the alignment would continue along the existing right-of-way on the east side of Third Avenue S, in an existing gravel parking strip, east to the north side of S Lander Street and crossing over mainline railroad tracks. The Green Line would then turn west for a short segment on S Lander Street, with the guideways on the north side of Lander. The alignment would then turn south, with two alignment options evaluated:

- **Alternative 5.1.1 (Utah Avenue S).** This alignment option would turn south onto Utah Avenue S, with the guideways located along the west side of the street, adjacent to the Alternative C-2 SODO Operations Center, and replacing the existing parking lane. This option could also include switches on Utah Avenue S to a guideway to the Operations Center. As the guideway continues along the west side of Utah Avenue S it would rise in profile from a typical height of about 35 feet to 50 feet to clear the southeast corner of a building on the northwest corner of Utah Avenue S and S Horton Street. The guideway would continue along S Horton Street to rise from 50 feet to 80 feet to cross over SR 99 and Burlington Northern Santa Fe (BNSF) and Union Pacific (UP)

railroad tracks to the Port of Seattle's Terminal 25 adjacent to the West Seattle Bridge. Several design refinements have been made for the structures required in this area to address clearance issue and to minimize potential conflicts with businesses along S. Horton Street and to the railroad and Port operations.

- **Alternative 5.1.2 (First Avenue S).** This alignment option would turn south on First Avenue S with the guideways on the west side of the street, then turn west to the north side of S Horton Street, climbing to a bridge crossing over SR 99 and BNSF railroad tracks to Terminal 25.

Alternative 5.1 evaluates the following station alternatives:

- **Weller/King Street 1 (Standard).** This alternative would be a side platform station located at the west end of the Weller Street pedestrian overpass, just to the south of King Street Station. The station would have a mezzanine level and would be designed to accommodate event-size crowds.
- **Safeco Field 1.** This alternative would feature an event/turnback station located between Third and Fourth Avenues S and S Royal Brougham Way and S Atlantic Streets. The station would be horizontally arranged with a side platform, but would also have a concourse level and several entrances to serve event crowds. The station platforms for this alternative are anticipated to be constructed about 70 feet above ground level (higher than typical stations) because of the need for the approaching guideways to maintain adequate clearance above the railroad tracks, highway structures, and other facilities. Two sets of switches and storage tracks could be located south of the station, near S Holgate Street.
- **Lander.** Three site options are being evaluated for a station in this area. All three may also have bus layover facilities located on-site or on adjacent streets.
 - **Lander 1 (Northeast).** This side platform station would be located on the northeast corner of the intersection of First Avenue S and S Lander Street. The station building would be on property to the north of S Lander Street. On-street bus zones would be provided, and an optional bus layover facility could be sited on the next property to the north of the station.
 - **Lander 2 (Southwest).** For this option, a side platform station with a mezzanine would be located on the west side of First Avenue S to the south of the intersection of First Avenue S and S Lander Street. The station building would be located on property to the west of First Avenue S. On-street bus zones would be provided, with an option to provide an off-street bus layover facility west of the station building, near the east side of Utah Avenue S.
 - **Lander 4 (Utah).** This side platform station with a mezzanine would be located on the southwest corner of S Lander Street and Utah Avenue S. The station building would be located on property to the west of Utah Avenue S, at a site that is also being considered for an Operations Center. On-street bus zones would be provided.

3.8.5.2 Alternative 5.2 - West Side of Third/Utah

This alignment alternative would be similar to Alternative 5.1 to S Royal Brougham Way. However, this alternative would construct only one event station (at Weller/King) for the stadium area. After crossing S Royal Brougham Way, the alignment would travel along the west side of Third Avenue S toward S Lander Street. In response to comments received on the Draft EIS and further engineering study, this alignment for this alternative has been refined to feature shorter spans across the railroad tracks in the north SODO area and to maximize truck access to the stadiums.

As the alignment approaches the Seattle Public Schools (SPS) property at the northwest corner of the intersection of Third Avenue S and S Lander Street, it would curve from the west side of Third Avenue S onto an alignment at approximately 40 degrees from the centerline of S Lander Street and would continue on this diagonal behind the SPS main building to the intersection of S Lander Street and Utah Avenue S. This is a refinement from the Draft EIS, based on public comments. After passing the intersection of S Lander Street and Utah Avenue S, the guideway would continue to the north side of S Horton Street. The alignment would also feature a refined design for special, long spans along Utah Avenue S and S Horton Street that would allow for turning movements for large trucks used by businesses in the area.

Alternative 5.2 evaluates the following station alternatives:

- **Weller/King Street 2 (Event).** This station would be a side platform station sized to accommodate event crowds. The station would be located south of the west end of the Weller pedestrian bridge and would accommodate three platform edges for the Downtown Turnback. Station and guideway supports would span the existing access road. The station mezzanine area would be connected to the south edge of the existing Weller pedestrian bridge and also would have queuing ramps, escalators and elevators to the sidewalks below the station.
- **Lander 3 (Diagonal).** This station alternative would be located diagonally on the property north of S Lander Street between First and Occidental Avenues S. The guideways would be diagonal to the street grid, and the station would have a side platform configuration, with the station building and entry located east of First Avenue S. This alternative also includes an option to locate a bus layover facility to the north of the station building. The parcel at the northeast corner of First Avenue S and S Lander Street could be acquired for construction staging.

3.8.5.3 Alternative 5.2(s) – West Side of Third/Utah with single beam

This alignment alternative would continue past S Jackson Street and cross to the west of the King Street Station in a horizontal dual beam configuration, continuing south to a station near the Weller Street pedestrian crossing, which is located adjacent to the existing parking lot north of Seahawks Stadium. This station would feature switches for a Downtown Turnback. After the Weller/King station, the Green Line would curve slightly southeast and feature a bridge structure to cross over mainline railroad tracks and the Fourth Avenue S/I-90 ramps east of the Seahawks Stadium, and then travel along the west side of an existing access road by the railroad, continuing south toward S Royal Brougham Way and Safeco Field, where a station would serve the ballpark.

Switches located south of the Safeco station would allow for a transition from a horizontal dual beam guideway configuration to a single beam along the west side of Third Avenue South. The single beam would follow a diagonal alignment to the S Lander Street area, where another set of switches north and south of the Lander station would allow for a transition back to a horizontal dual beam configuration to serve the Lander station and provide a passing area. The alignment would return to a single beam configuration south of the Lander station along the west side of Utah Avenue S and the north side of S Horton Street, with switches and a dual beam passing area located near S Horton Street.

Stations evaluated with Alternative 5.2(s) include:

- **Weller/King Street 2 (Event).** This station would be a side platform station sized to accommodate event crowds. The station would be located south of the west end of the Weller pedestrian bridge and would accommodate three platform edges for the Downtown Turnback. Station and guideway supports would span the existing access road. The station mezzanine area would be connected to the south edge of the existing Weller pedestrian bridge and also would

have queuing ramps, escalators and elevators to the sidewalks below the station (see Figure 3-25, p.3-82).

- **Safeco Field 1.** This alternative would feature an event/turnback station located between Third and Fourth Avenues S and S Royal Brougham Way and S Atlantic Streets. The station would be horizontally arranged with a side platform, but would also have a concourse level and several entrances to serve event crowds. The station platforms for this alternative are anticipated to be constructed about 70 feet above ground level (higher than typical stations) because of the need for the approaching guideways to maintain adequate clearance above the railroad tracks, highway structures, and other facilities. Two sets of switches and storage tracks could be located south of the station, near S Holgate Street (see Figure 3-26, p.3-83).
- **Lander 3 (Diagonal).** This station alternative would be located diagonally on the property north of S Lander Street between First and Occidental Avenues S. The guideways would be diagonal to the street grid, and the station would have a side platform configuration, with the station building and entry located east of First Avenue S. This alternative also includes an option to locate a bus layover facility to the north of the station building. The parcel at the northeast corner of First Avenue S and S Lander Street could be acquired for construction staging (see Figure 3-27, p.3-84).

3.8.5.4 Preferred Alternative: SODO/Chinatown International District/Pioneer Square Segment

The Preferred Alternative for this EIS for the SODO/Chinatown International District/Pioneer Square Segment would use the **Alternative 5.2(s)** single beam alignment. This alignment alternative would continue past S Jackson Street and cross to the west of the King Street Station in a horizontal dual beam configuration, continuing south to a station near the Weller Street pedestrian crossing, which is located adjacent to the existing parking lot north of Seahawks Stadium. This station would feature switches for a Downtown Turnback. After the Weller/King station, the Green Line would curve slightly southeast and feature a bridge structure to cross over mainline railroad tracks and the Fourth Avenue S/I-90 ramps east of the Seahawks Stadium, and then travel along the west side of an existing access road by the railroad, continuing south toward S Royal Brougham Way and Safeco Field, where a station would serve the ballpark.

Switches located south of the Safeco station would allow for a transition from a horizontal dual beam guideway configuration to a single beam along the west side of Third Avenue South. The single beam would follow a diagonal alignment to the S Lander Street area, where another set of switches north and south of the Lander station would allow for a transition back to a horizontal dual beam configuration to serve the Lander station and provide a passing area. The alignment would return to a single beam configuration south of the Lander station along the west side of Utah Avenue S and the north side of S Horton Street, with switches and a dual beam passing area located near S Horton Street.

Stations included as part of the Preferred Alternative include:

- **Weller/King Street 2 (Event).** This station would be a side platform station sized to accommodate event crowds. The station would be located south of the west end of the Weller pedestrian bridge and would accommodate three platform edges for the Downtown Turnback. Station and guideway supports would span the existing access road. The station mezzanine area would be connected to the south edge of the existing Weller pedestrian bridge and also would have queuing ramps, escalators and elevators to the sidewalks below the station (see Figure 3-25, p.3-82).

- **Safeco Field 1.** This alternative would feature an event/turnback station located between Third and Fourth Avenues S and S Royal Brougham Way and S Atlantic Streets. The station would be horizontally arranged with a side platform, but would also have a concourse level and several entrances to serve event crowds. The station platforms for this alternative are anticipated to be constructed about 70 feet above ground level (higher than typical stations) because of the need for the approaching guideways to maintain adequate clearance above the railroad tracks, highway structures, and other facilities. Two sets of switches and storage tracks could be located south of the station, near S Holgate Street (see Figure 3-26, p.3-83).
- **Lander 3 (Diagonal).** This station alternative would be located diagonally on the property north of S Lander Street between First and Occidental Avenues S. The guideways would be diagonal to the street grid, and the station would have a side platform configuration, with the station building and entry located east of First Avenue S. This alternative also includes an option to locate a bus layover facility to the north of the station building. The parcel at the northeast corner of First Avenue S and S Lander Street could be acquired for construction staging (see Figure 3-27, p.3-84).

3.8.6 West Seattle Segment

After traveling south through SODO, the monorail would turn west to cross the Duwamish River on or near the existing West Seattle Bridge. It would serve the Delridge community and then travel uphill to Avalon, the Alaska Junction and the Morgan Junction. Two distinct, full-segment alignment alternatives are evaluated for West Seattle, with several areas where a single beam configuration is evaluated, and several new or refined alignment sub-segment alternatives for the Delridge area that were developed in response to comments on the Draft EIS as well as additional engineering and design studies.

Because of the complexity of the alternatives in the West Seattle Segment and because alignment alternatives in different geographic portions of West Seattle can be mixed and matched (even though, as in other segments, full-segment alternatives were packaged and numbered for ease of analysis), the alignment alternatives for West Seattle are described by their component parts. Because several refined and updated alternatives were developed for the Delridge area following comments received on the Draft EIS, these alternatives have been given new numbers as shown below.

3.8.6.1 Duwamish Crossing

The Green Line will cross the Duwamish River either on top of the existing West Seattle Bridge or on a new, monorail-only bridge. Three alternative alignments across the Duwamish River have been evaluated. Although these alternatives have been numbered to correspond with alignments in other areas of West Seattle, any of them could be paired with any other alignment alternative in other areas of West Seattle.

Alternative 6.1 (West Seattle I). After rising on a special structure on S Horton Street to cross above the Spokane Street Overcrossing (SR 99) and BNSF tracks to Terminal 25, the Green Line would travel southwest in a horizontal dual beam configuration through Terminal 25 property turning west to align parallel and just north of the south property line of Terminal 25. The guideway would then climb to cross over to the westbound lanes of the West Seattle Bridge, aligning the guideway above the center median of the existing bridge. On this portion of the West Seattle Bridge, locating the guideway in the median could require placing columns within the center barrier area, reducing the clearance between travel lanes and the median by one foot (from the existing three feet to two feet) and reducing westbound and eastbound lane widths by one foot (from the existing 12 feet to 11 feet).

The West Seattle Bridge would also require a structural retrofit to ensure that the guideway could be accommodated and meet seismic requirements. In this alternative, the guideway would remain on the median of the existing bridge over the Duwamish River, with a guideway structure approximately 25 feet above the bridge deck, and nearly 200 feet above the ground.

Departing south from the West Seattle Bridge, Alternative 6.1 evaluates two alignment options to reach the Delridge area:

- **Alternative 6.1.1 (Past Pigeon Point).** This alignment option would remain on the West Seattle Bridge past Pigeon Point (the western portion of the Duwamish greenbelt to the south of the bridge) before turning southwest on a special span over the eastbound lanes of the bridge to travel along the west side of Delridge Way SW. The guideways would be approximately 75 to 80 feet above ground after departing the bridge.
- **Alternative 6.1.2 (To Pigeon Point).** This alignment option would curve southwest from the median of the West Seattle Bridge onto the Pigeon Point area of the Duwamish greenbelt, placing columns and other structural supports within the greenbelt slope. The alignment would then cross over Delridge Way SW to travel along the west side of the street, with the guideways approximately 75 to 80 feet above the ground.

Alternative 6.1(s) (West Seattle I – single beam) would feature a single beam guideway configuration traveling across the West Seattle Bridge. With this alternative, a set of switches would be located near S Horton Street to provide a dual beam passing area for monorail trains before their ascent to the West Seattle Bridge.

The guideway would then transition back to a single beam configuration to travel across the center of the West Seattle Bridge. The guideway would climb to cross over to the westbound lanes of the West Seattle Bridge, aligning the guideway above the center median of the existing bridge. On this portion of the West Seattle Bridge, locating the guideway in the median could require placing columns within the center barrier area, reducing the clearance between travel lanes and the median by one foot (from the existing three feet to two feet) and reducing westbound and eastbound lane widths by one foot (from the existing 12 feet to 11 feet).

The West Seattle Bridge would also require a structural retrofit to ensure that the guideway could be accommodated and meet seismic requirements. In this alternative, the guideway would remain on the median of the existing bridge over the Duwamish River, with a guideway structure approximately 25 feet above the bridge deck, and nearly 200 feet above the ground.

Departing south from the West Seattle Bridge, Alternative 6.1(s) evaluates two alignment options to reach the Delridge area:

- **Alternative 6.1.1(s) (Past Pigeon Point).** This alignment option would remain on the West Seattle Bridge past Pigeon Point (the western portion of the Duwamish greenbelt to the south of the bridge) before turning southwest on a special span over the eastbound lanes of the bridge to travel along the west side of Delridge Way SW. The guideway beam would be approximately 75 to 80 feet above ground after departing the bridge.
- **Alternative 6.1.2(s) (To Pigeon Point).** This alignment option would curve southwest from the median of the West Seattle Bridge onto the Pigeon Point area of the Duwamish greenbelt, placing columns and other structural supports within the greenbelt slope. The alignment would then cross over Delridge Way SW to travel along the west side of the street, with the guideway approximately 75 to 80 feet above the ground.

After departing the West Seattle Bridge, the guideway would transition to a horizontal dual beam configuration at a switch near the existing fire station.

Alternative 6.2 (West Seattle II). This alternative would feature a new, monorail-only bridge crossing of the Duwamish Waterway.

After rising onto a special structure to cross SR 99 and the BNSF mainline tracks to Port of Seattle property and curving southwest toward the West Seattle Bridge, the Green Line would continue to a new bridge crossing about 40 feet north of the West Seattle Bridge and south of SW Spokane Street. At its crest, the guideways on the bridge would be approximately 160 feet high (similar to the existing West Seattle Bridge), but the bridge would remain higher on its western descent to provide clearance for crossings over the West Seattle Bridge off-ramp to Delridge Way SW and W Marginal Way SW.

3.8.6.2 Delridge Alignment and Station Location Alternatives

In response to comments received on the Draft EIS, SMP has evaluated seven alignment alternatives for the Delridge area along with a number of different alternatives for station locations and types. These alternatives can be combined with any of the Duwamish Crossing alternatives as well as with any of the other alternatives for other areas in West Seattle, regardless of the numbering scheme they have been assigned.

Alternative 6.1 (West Seattle I). This alternative would travel in a horizontal dual beam configuration along the west side of Delridge Way SW to SW Andover Street, where it would turn west for a block on the north side of SW Andover Street before turning southwest at 26th Avenue SW to reach a Delridge station. The alignment would then cross to the intersection of SW Andover Street and 26th Avenue SW, spanning Longfellow Creek, to align with the north side of SW Yancy Street. The alignment would continue on SW Yancy Street for several blocks before crossing over 30th Avenue SW to the center of SW Avalon Way. This alignment alternative would include a station in the Delridge area:

- **Delridge 1 (26th).** This alternative would include a center platform station located to the southwest of SW Andover Street and 26th Avenue SW. The station platform would span 26th Avenue SW and could be 60 feet above ground or higher due to the descent from the West Seattle Bridge and the desire to minimize the grade changes on the climb to Avalon. The station is anticipated to have two entries, one on the north towards SW Andover Street, and the other to the south toward SW Yancy Street. Bus stops and layover facilities could be located on the street, with an option to locate bus facilities on the property to the south of the station.

Alternative 6.2 (West Seattle II). The alignment in this alternative would cross over the Chelan Avenue SW eastbound loop ramp of the West Seattle Bridge in a horizontal dual beam configuration before entering the southern portion of the existing steel plant property located west of Delridge Way SW. It would cross the property diagonally to align with SW Andover Street, where a station would be located. The alignment would continue west on SW Andover Street for an additional block before crossing property to the south of the steel plant to reach SW Avalon Way. This alternative would include a station in the area:

- **Delridge 2 (Andover).** This side platform station with a mezzanine would be located on the south side of SW Andover Street, west of the intersection with 26th Avenue SW. The station could require supporting structures spanning SW Andover Street. The station could function as a bus transfer center, with bus stops and layover facilities located on street, with an option to locate bus facilities on the property to the southeast of the station.

Alternative 6.3(s) (Delridge North single beam). This subsegment alternative focused on the Delridge area would feature a single beam configuration located north of the steel plant and south of the western approaches to the West Seattle Bridge. With this alternative, the guideway would travel past the active steel mill above the right-of-way of SW Spokane Street to serve a station near Delridge Way SW. Switches located near the existing fire station and east of the station would facilitate a transition (if needed) from a single beam configuration over the West Seattle Bridge to a horizontal dual beam configuration to serve the station. Switches located west of the station would provide a transition back to a single beam configuration, with a third set of switches located near the intersection of SW Avalon Way and SW Genesee Street to provide a transition back to a horizontal dual beam configuration.

This alternative includes one station alternative for the Delridge area:

- **Delridge 3 (Nucor).** The station associated with this subsegment alternative would be a side platform station with entry building and station site outside the right-of-way line on the south side of SW Spokane Street, west of the intersection with Delridge Way SW. The center of the platform would be on a line about 35 feet south of the south right-of-way line of SW Spokane Street.

Alternative 6.4 (Andover/Yancy). With this subsegment alternative focusing on the Delridge area, a horizontally aligned guideway would travel from the West Seattle Bridge across the southeast side of the steel plant's parking lot, then turn onto the east side of SW Charlestown Street, and then – between 26th Avenue SW and 28th Avenue SW – transfer to the south side of SW Andover Street, where a station would be located, before turning onto the north side of SW Yancy Street. The guideway would avoid crossing the open stretch of Longfellow Creek by crossing on public right-of-way where the creek has entered a culvert. This alternative includes one station alternative for the Delridge area:

- **Delridge 1A (26th).** This side platform station would be located southwest of SW Andover Street and 26th Avenue SW and SW Yancy Street. It would feature an on-street bus zone with off-street bus layover facilities.

Alternative 6.4(s) (Andover/Yancy single beam). Because of the technical difficulties of locating a station in the Delridge area due both to the topography and the presence of the steel plant, West Seattle Bridge and its on-ramps, and Longfellow Creek, this single beam option evaluates an alignment that would not include a station in the Delridge area, but would rather provide access to Delridge residents at the Avalon station. Under this alternative, a single beam guideway would travel from the West Seattle Bridge across the southeast side of the steel plant's parking lot, then turn onto the east side of SW Charlestown Street, and then transfer to the south side of SW Andover Street, before turning onto the north side of SW Yancy Street. Switches would facilitate the transition in and out of a single beam configuration.

Alternative 6.5 (Genesee). With this alternative, which covers the Delridge subsegment, horizontally aligned guideways would travel from the West Seattle Bridge along the west side of Delridge Way SW, cross over the intersection with SW Andover Street, and align with the west side parking/loading lane of Delridge Way SW. The guideways would curve to a line about 25 feet west of the west right-of-way line of Delridge Way SW through the station area, centered about 560 feet south of SW Andover Street. The guideways would follow the south side of SW Genesee Street until slanting to the north side of the street in the last 250 feet of SW Genesee Street before curving to the center of SW Avalon Way. The Delridge area station associated with this subsegment alternative is:

- **Delridge 4 (Genesee).** This side platform station with entry building and station site would be located outside the right-of-way line on the west side of Delridge Way SW, about 560 feet south

of the intersection with SW Andover Street. The station platforms would be centered on a line about 25 feet west of the west right-of-way line of Delridge Way SW.

3.8.6.3 Avalon Alignment and Station Locations

After traveling along the center of SW Avalon Way, the Green Line will serve the Avalon area with a station and then travel to the Alaska Junction via either Fauntleroy Way SW and SW Alaska Street or 35th Avenue SW and SW Alaska Street. The EIS studies five different alternative alignments in this area, any of which could be combined with any Delridge alignment or either alignment for the Alaska Junction. Horizontal dual beam guideways are evaluated for all alternatives in this area of West Seattle.

Alternative 6.1 (West Seattle I). After leaving the Delridge area, the alignment would travel along the existing two-way center turn lane of SW Avalon Way, up to 35th Avenue SW and then to Fauntleroy Way SW. This alternative includes two alignment options for the portion of the alignment connecting from 35th Avenue SW to the intersection of Fauntleroy Way SW and SW Alaska Street.

- **Alternative 6.1.3 (Northwest Side of Fauntleroy).** This alignment option would travel along the center of SW Avalon Way to serve the Avalon 1 (Center) station alternative. The alignment would then cross Fauntleroy Way SW and travel along the north side of the street in an existing parking/loading lane. The curving section crossing over Fauntleroy Way SW could require supporting structures straddling SW Avalon Way or Fauntleroy Way SW or their intersection.
- **Alternative 6.1.4 (Southeast Side of Fauntleroy).** This alignment option would continue along the center of SW Avalon Way using the Avalon 1 (Center) station, then curve to the south side of Fauntleroy Way SW to SW Alaska Street, in an existing parking/loading lane. The guideway would cross over Fauntleroy Way SW approaching SW Alaska Street, where supporting structures could straddle Fauntleroy or Alaska or the Fauntleroy/Alaska intersection.

Either of these alignment alternatives would serve a station in the Avalon area:

- **Avalon 1 (Center).** This side platform station with a mezzanine would be located over the center of SW Avalon Way, between 35th and 36th Avenues SW. A support structure would span Avalon, and a mezzanine level would connect to a station building and access on the triangular block to the north of Avalon. The station would include on-street bus zones.

Alternative 6.2 (West Seattle II). With this alternative, the alignment would travel in the center of SW Avalon Way to the east side of 35th Avenue SW, where it would serve a station near SW Oregon Street before turning west along the center of SW Alaska Street. In addition to this **East of 35th/Center of Alaska** alignment, this alternative also evaluates two other alignment options in this area:

- **Alternative 6.2.1 (East of 35th, North of Alaska)** would feature an alignment along the east side of 35th Avenue SW with a station on 35th Avenue SW near SW Oregon Street before turning west on the north side of SW Alaska Street.
- **Alternative 6.2.2 (Center of 35th, North of Alaska)** would feature an alignment along the center of 35th Avenue SW with a station on 35th Avenue SW near SW Oregon Street before turning west on the north side of SW Alaska Street.

These alignment alternatives would serve one of two station alternatives in the Avalon area:

- **Avalon 2A (35th).** This center platform station would be located on the northwest corner of the West Seattle Stadium Park property owned by the City of Seattle Parks Department, to the east of 35th Avenue SW and opposite the junction with SW Oregon Street. It would serve Alternative 6.2.1. The station would include on-street bus zones. The station has been revised from the Draft

EIS to feature a similar station house location, but shifted slightly to the west and over 35th Avenue SW.

- **Avalon 2B (35th).** This side platform station would be located on the west side of 35th Avenue SW near SW Oregon Street. It would serve Alternative 6.2.2, a center alignment along 35th Avenue SW.

3.8.6.4 Alaska Junction Alignment and Station Location Alternatives

Two distinct alignment alternatives with several corresponding station alternatives have been evaluated for the Alaska Junction area. As with other areas in the West Seattle segment, either of these two alternatives could be combined with any alignment alternative from any other portion of West Seattle.

Alternative 6.1 (West Seattle I). As the Green Line continues west on SW Alaska Street, it would travel along the north side of SW Alaska Street before turning south to align with the west side of 42nd Avenue SW. The Alaska Junction 1 (42nd/Edmunds) station would be located mid-block on 42nd Avenue SW between SW Alaska and SW Edmunds Streets. The alignment would then curve southwest at SW Edmunds Street to reach California Avenue SW, crossing diagonally over a portion of the block southeast of the intersection of Edmunds and California. The guideways would transition to a vertical dual beam configuration to serve the 42nd Avenue SW station; however, an alternate side platform station is also evaluated, which would maintain the horizontal guideways throughout this portion of the alignment. Station alternatives include:

- **Alaska Junction 1 (42nd/Edmunds).** This vertical station would be located mid-block on private property to the west of 42nd Avenue SW, between SW Alaska and SW Edmunds Streets, with an entrance from 42nd Avenue SW. The station would include on-street bus zones.
- **Alaska Junction 1A (42nd/Edmunds).** This side platform station would be located mid-block on private property to the west of 42nd Avenue SW, between SW Alaska and SW Edmunds Streets, with an entrance from 42nd Avenue SW. Additional property acquisition may be required on the east side of 42nd Avenue SW to accommodate touchdown of emergency exits. Platform and mezzanine would extend over the street. The station would include on-street bus zones.

Alternative 6.2 (West Seattle II). Under this alternative, the Green Line would continue along SW Alaska Street, crossing California Avenue SW and then turning south, approaching 44th Avenue SW to an Alaska Junction station located on the east side of 44th Avenue SW. The alignment would then curve southeast from 44th Avenue SW to reach California Avenue SW. This alternative would feature the following Alaska Junction station alternative:

- **Alaska Junction 2 (44th/California).** This side platform station with a mezzanine would be located on property to the east of 44th Avenue SW, in the middle of the block between SW Alaska and SW Edmunds Streets. The entrance could be at the north end of the station for connections to the existing bus transit center on SW Alaska Street. The station would include on-street bus zones.

3.8.6.5 California/Morgan Junction Alignment and Station Locations

After the Alaska Junction, the Green Line will travel along California Avenue SW – either on the west side, east side, or center – to a station at the Morgan Junction. Alternative 6.1 has been refined in response to EIS comments and ongoing work to include a west side alignment along California Avenue SW. A single beam configuration along the west side is also included in this area. The alignment alternatives – again, using numbers that were developed for full-segment alternatives for analysis but that

can be combined with differently numbered alignments in other portions of West Seattle – include the following:

Alternative 6.1 (West Seattle I). This alternative would feature horizontal dual beam guideways. Once the Green Line reaches California Avenue SW south of SW Edmunds Street, it would continue south along the center of California Avenue SW to a station and terminus at Morgan Junction, near the intersection of California Avenue SW, Fauntleroy Way SW, and SW Morgan Street. With a center alignment on California Avenue SW, center left turn lanes could be eliminated or provided only at major intersections. In response to comments and continuing analysis, a refined alternative has been developed in addition to the center alignment:

- **Alternative 6.1.6 (West of California).** This alignment option would feature a horizontal dual beam guideway configuration along the west side of California Avenue SW, along a line about 15 feet west of the west right-of-way line of California Avenue SW. With a west side alignment in the existing parking/loading lane on California Avenue SW, the center left turn lanes would remain.

The center or west side alignment would transition to a vertical configuration to serve a vertical station alternative at Morgan Junction or remain in a horizontal configuration to serve a terminus station:

- **Morgan Junction 1 (West).** This vertical station would be located on property west of California Avenue SW, between SW Beveridge Place and the SW Eddy Street right-of-way, with platforms and supporting structures extending to meet guideways in the center of California Avenue SW. Crossover switches could be located on the guideway, north of SW Graham Street. The station would include on-street bus zones.
- **Morgan Junction 1A (West).** This terminus station would be located on property west of California Avenue SW, between SW Beveridge Place and the SW Eddy Street right-of-way. Only the west side platform would be constructed on this property to meet a guideway beam on the west side of California Avenue SW. A switch would be provided just south of SW Graham Street, to transition the guideway from a single beam to dual beams. The west side beam would connect to the single level Morgan station. Future extension of the line to the south could be accommodated, if needed, by constructing a platform and station house for the east side at the location of the pocket track.

Alternative 6.1.6(s) (West of California single beam). The EIS also evaluates a single beam configuration along the west side of California Avenue SW. This alignment option would follow a line about 15 feet west of the west right-of-way line of California Avenue SW but with a single rather than a double beam configuration. With a west side alignment in the existing parking/loading lane on California Avenue SW, the center left turn lanes would remain. Switches would be located south of SW Edmunds Street and north of SW Morgan Street to provide a transition from dual beam to single beam and then back again to serve the station at storage track at the Morgan Junction. The station with this alternative would be:

- **Morgan Junction 1A (West).** This terminus station would be located on property west of California Avenue SW, between SW Beveridge Place and the SW Eddy Street right-of-way. Only the west side platform would be constructed on this property to meet a guideway beam on the west side of California Avenue SW. With a west side alignment in the existing parking/loading lane on California Avenue SW, the center left turn lanes would remain. A switch would be provided just south of SW Graham Street, to transition the guideway from a single beam to dual beams. The west side beam would connect to the single level Morgan station. Future extension of the line to the south could be accommodated, if needed, by constructing a platform and station house for the east side at the location of the pocket track.

Alternative 6.2 (West Seattle II). Under this alternative, once on California Avenue SW, the Green Line would head south along the east side of the street to the Morgan Junction, with the guideways and support columns potentially using the existing east-side parking lane. It would serve a station at the Morgan Junction:

- **Morgan Junction 2 (Center).** This side platform station with a mezzanine would be located in the center of California Avenue SW, south of Fauntleroy Way SW. While the main station building would be to the east of California Avenue SW, the station could span the street, with supporting structures to the west of the street. The guideway for a tail track could extend about 400 feet to the south of the station (approaching SW Holly Street), and crossover tracks could be located on the guideway north of the station. The station would include on-street bus zones.

3.8.6.6 Preferred Alternative: West Seattle Segment

For analysis purposes in this EIS, alignment and station alternatives have been grouped into two segment-long alternatives (6.1 and 6.2) along with several subsegment alternatives for the Delridge area. The Preferred Alternative combines components from these different alternatives to create a route through West Seattle.

Duwamish Crossing: The Green Line would cross the Duwamish River atop the center median of the existing West Seattle High-Rise Bridge using a single beam configuration (**Alternative 6.1.1(s)**). Switches would be provided before and after the bridge to facilitate a transition from dual to single beam and back again. The guideway would depart the bridge past the Pigeon Point greenbelt so as to avoid impacts to the greenbelt.

Delridge: In the Delridge area, the Green Line would follow **Alternative 6.3(s) (Delridge North single beam)**. This alignment alternative would feature a single beam configuration located north of the steel plant and south of the western approaches to the West Seattle Bridge. With this alternative, the guideway would travel past the active steel mill above the right-of-way of SW Spokane Street to serve a station near Delridge Way SW. Switches located near the existing fire station and east of the station would facilitate a transition (if needed) from a single beam configuration over the West Seattle Bridge to a horizontal dual beam configuration to serve the station. Switches located west of the station would provide a transition back to a single beam configuration, with a third set of switches located near the intersection of SW Avalon Way and SW Genesee Street to provide a transition back to a horizontal dual beam configuration.

The Preferred Alternative includes a station to serve the Delridge area:

- **Delridge 3 (Nucor).** The station associated with this subsegment alternative would be a side platform station with entry building and station site outside the right-of-way line on the south side of SW Spokane Street, west of the intersection with Delridge Way SW. The center of the platform would be on a line about 35 feet south of the south right-of-way line of SW Spokane Street (see Figure 3-28, p.3-85).

Avalon: The Green Line would follow **Alternative 6.2.2** in the Avalon area. With this alternative, the alignment would travel in horizontal dual beam configuration in the center of SW Avalon Way to the center of 35th Avenue SW, where it would serve a station near SW Oregon Street before turning west along the north side of SW Alaska Street. It would serve a station in the Avalon area:

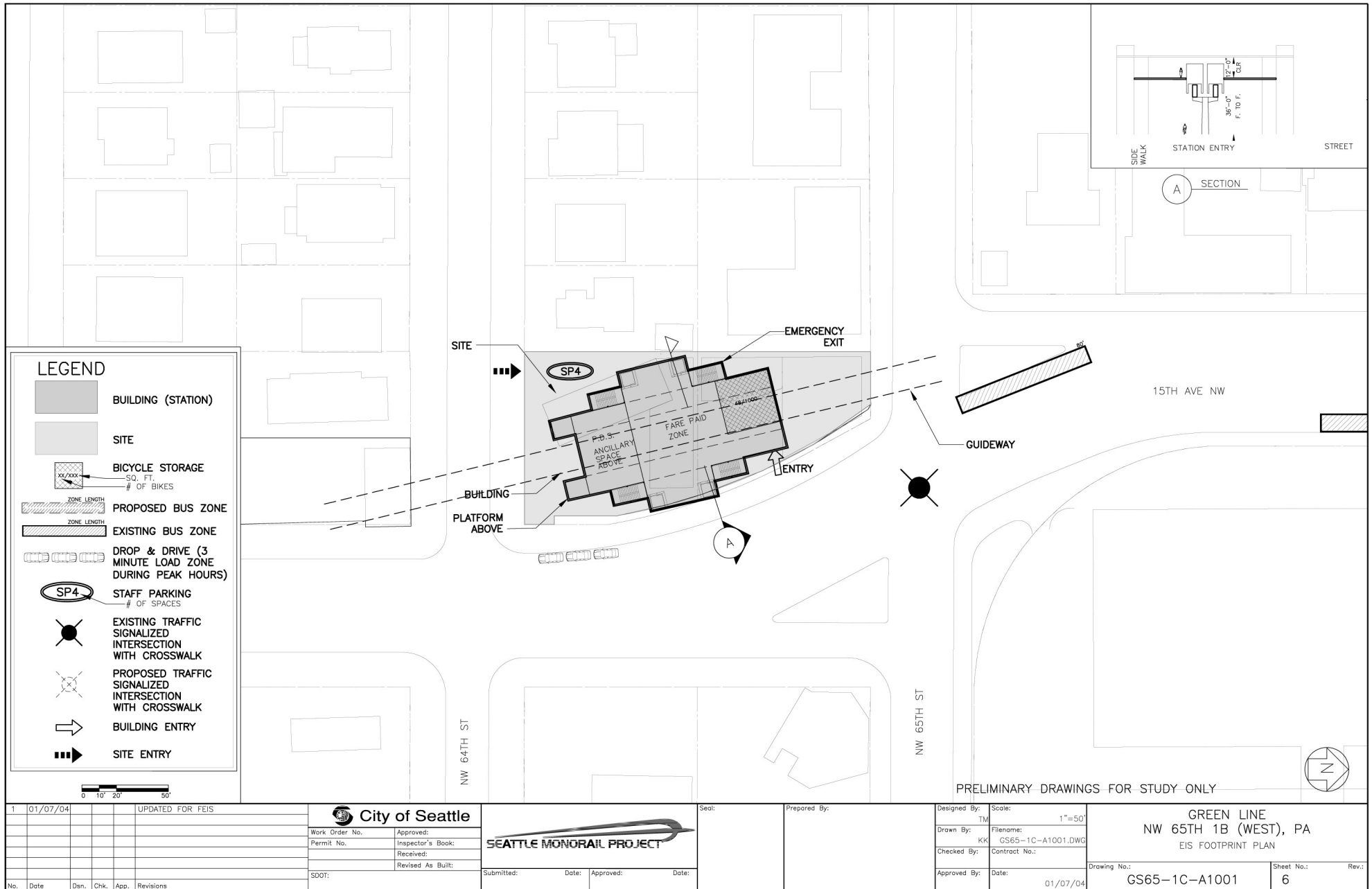
- **Avalon 2B (35th).** This side platform station would be located on the west side of 35th Avenue SW near SW Oregon Street. It would serve Alternative 6.2.2, a center alignment along 35th Avenue SW (see Figure 3-29, p.3-86).

Alaska Junction: The Green Line would then follow **Alternative 6.1** to serve the Alaska Junction. As the Green Line continues west on SW Alaska Street, it would travel along the north side of SW Alaska Street before turning south to align with the west side of 42nd Avenue SW. The Alaska Junction 1 (42nd/Edmunds) station would be located mid-block on 42nd Avenue SW between SW Alaska and SW Edmunds Streets. The alignment would then curve southwest at SW Edmunds Street to reach California Avenue SW, crossing diagonally over a portion of the block southeast of the intersection of Edmunds and California. The guideways would transition in and out of a vertical dual beam configuration to serve the 42nd Avenue SW station:

- **Alaska Junction 1 (42nd/Edmunds).** This vertical station would be located mid-block on private property to the west of 42nd Avenue SW, between SW Alaska and SW Edmunds Streets, with an entrance from 42nd Avenue SW. The station would include on-street bus zones (see Figure 3-30, p.3-87).

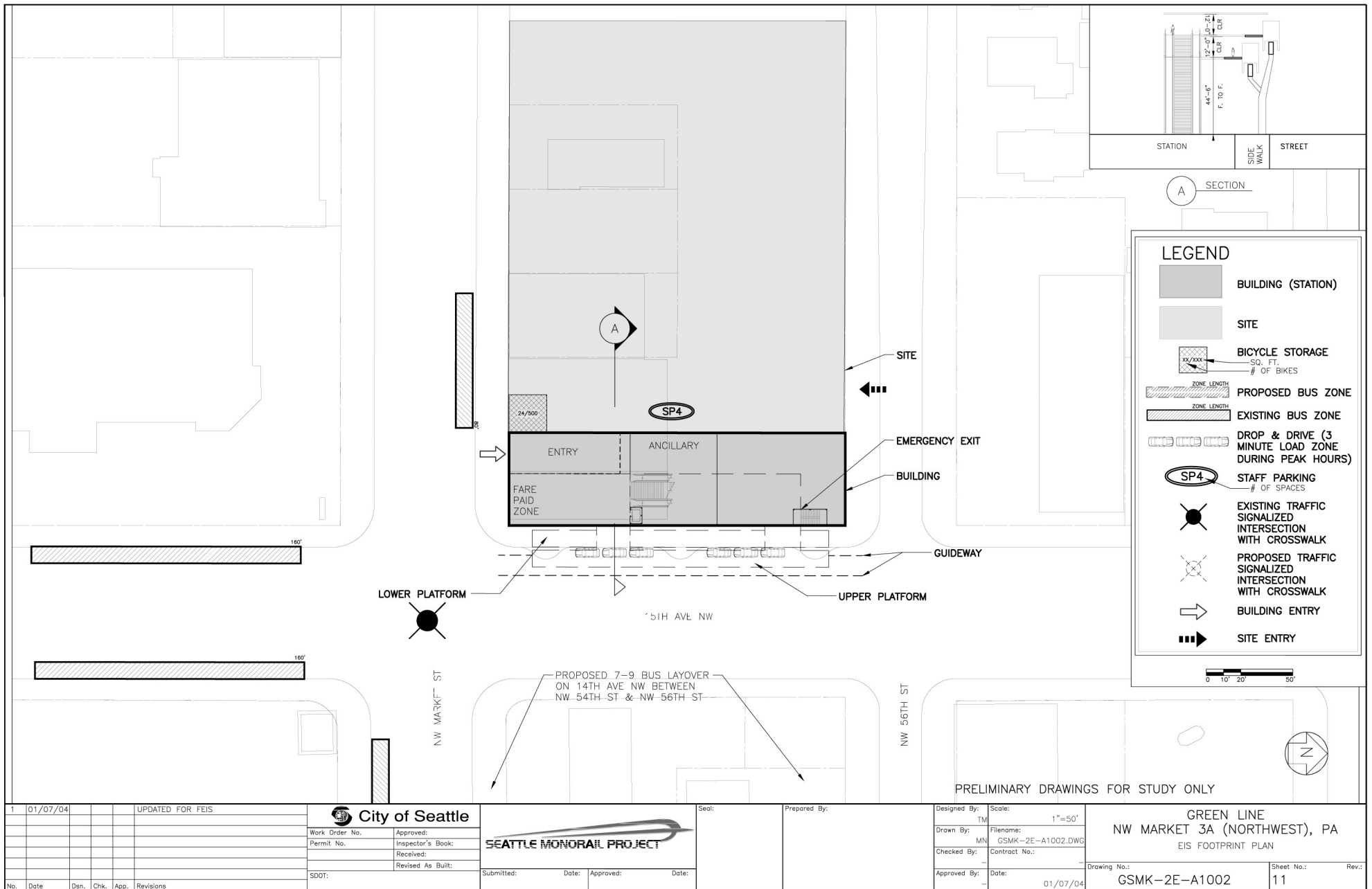
California/Morgan Junction: After turning onto California, the Green Line would travel in a single beam configuration along the west side of the street to the Morgan Junction (**Alternative 6.1.6(s)**). This alignment option would follow a line about 15 feet west of the west right-of-way line of California Avenue SW but with a single rather than a double beam configuration. With a west side alignment in the existing parking/loading lane on California Avenue SW, the center left turn lanes would remain. Switches would be located south of SW Edmunds Street and north of SW Morgan Street to provide a transition from dual beam to single beam and then back again to serve the station at storage track at the Morgan Junction. The station with this alternative would be:

- **Morgan Junction 1A (West).** This terminus station would be located on property west of California Avenue SW, between SW Beveridge Place and the SW Eddy Street right-of-way. Only the west side platform would be constructed on this property to meet a guideway beam on the west side of California Avenue SW. With a west side alignment in the existing parking/loading lane on California Avenue SW, the center left turn lanes would remain. A switch would be provided just south of SW Graham Street, to transition the guideway from a single beam to dual beams. The west side beam would connect to the single level Morgan station. Future extension of the line to the south could be accommodated, if needed, by constructing a platform and station house for the east side at the location of the pocket track (see Figure 3-31, p.3-88).



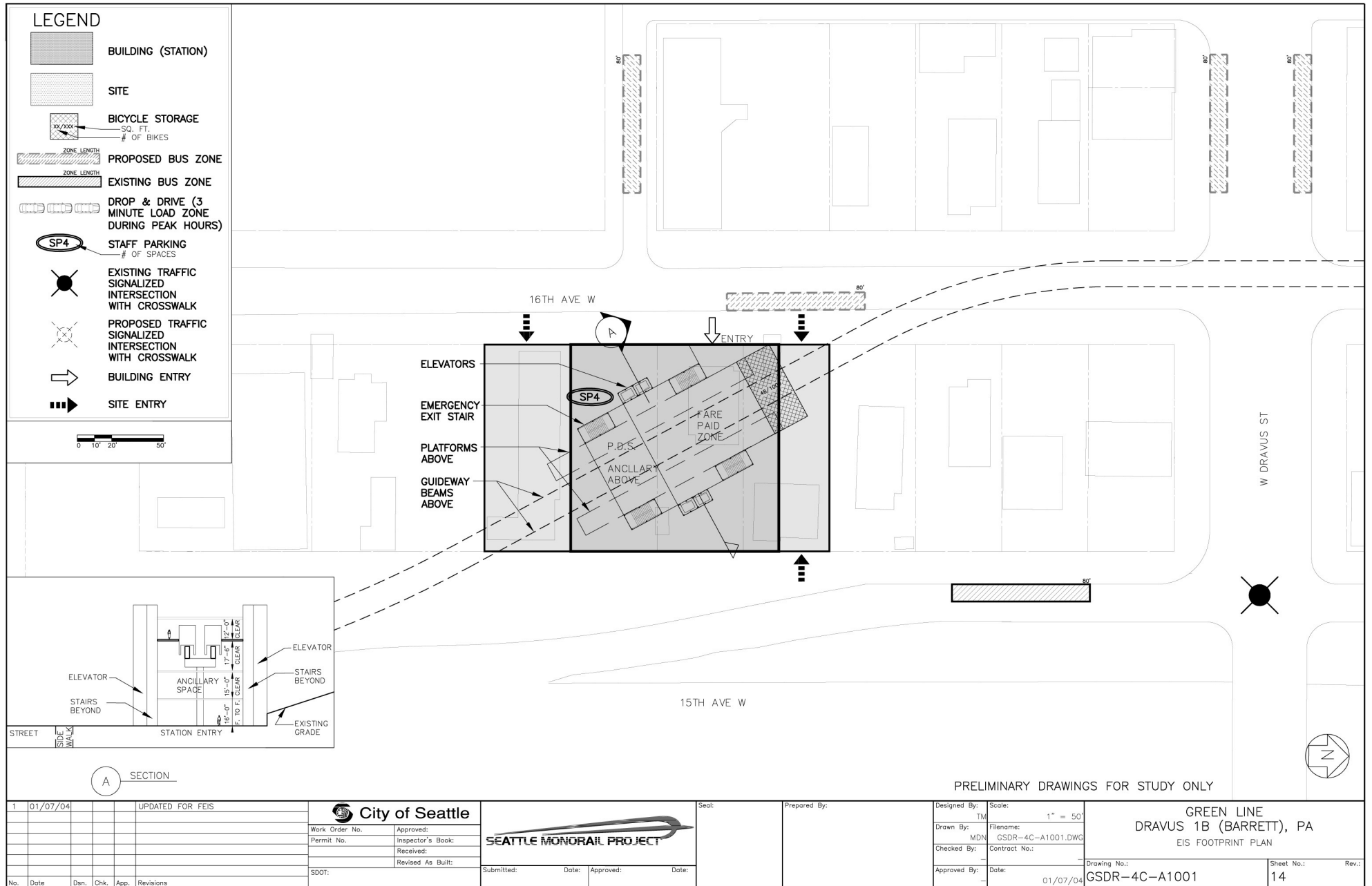
Note: Conceptual site plan for environmental impact review only. Actual design of station will vary, and may involve less or somewhat different property than depicted.

Figure 3-13
Preferred Alternative NW 65th Station
(NW 65th 1B, West)



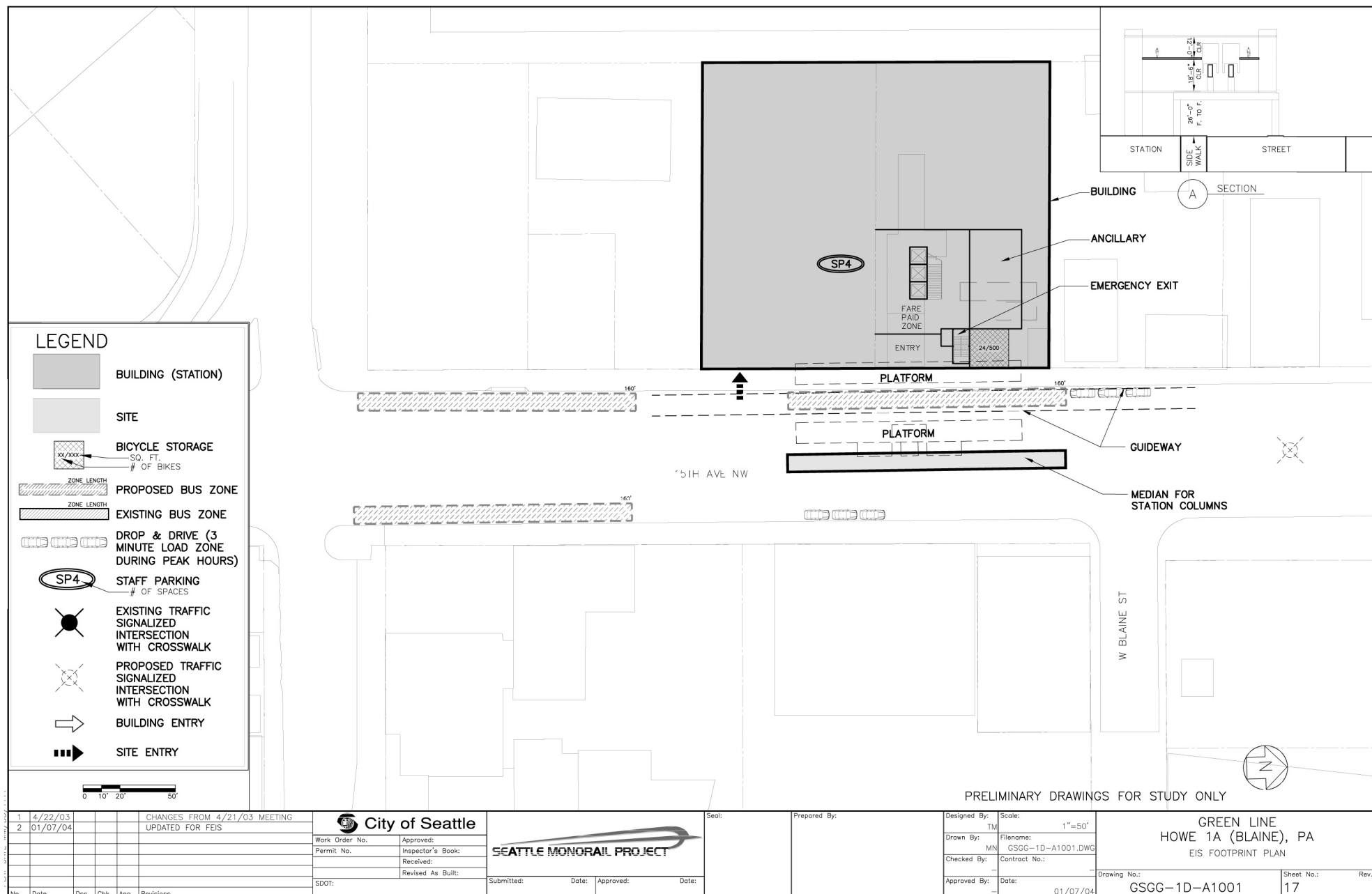
Note: Conceptual site plan for environmental impact review only. Actual design of station will vary, and may involve less or somewhat different property than depicted.

Figure 3-14
Preferred Alternative NW Market Station
(NW Market 3A, Northwest)



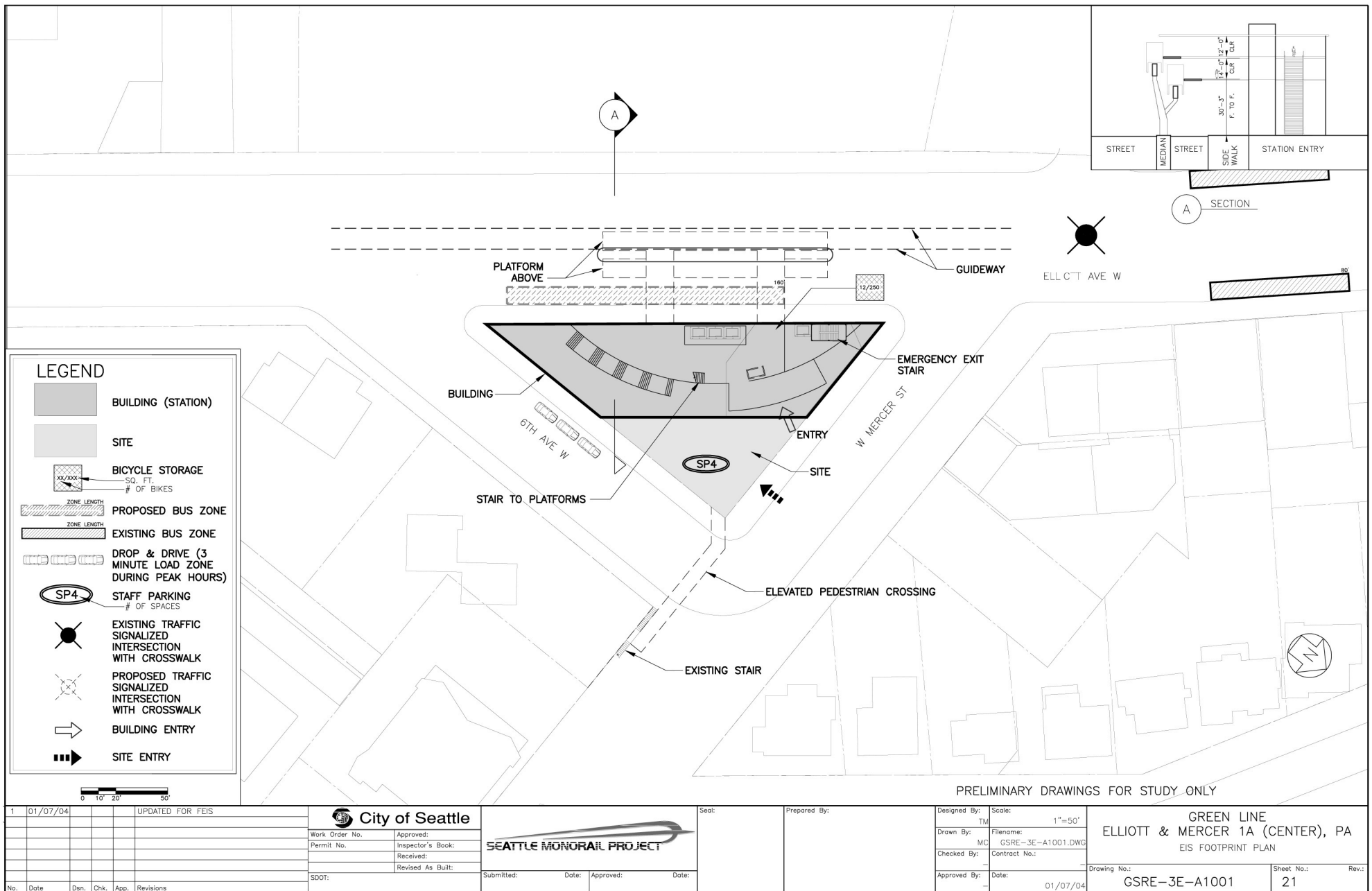
Note: Conceptual site plan for environmental impact review only. Actual design of station will vary, and may involve less or somewhat different property than depicted.

Figure 3-15
Preferred Alternative Dravus Station
(Dravus 1B, Barrett)



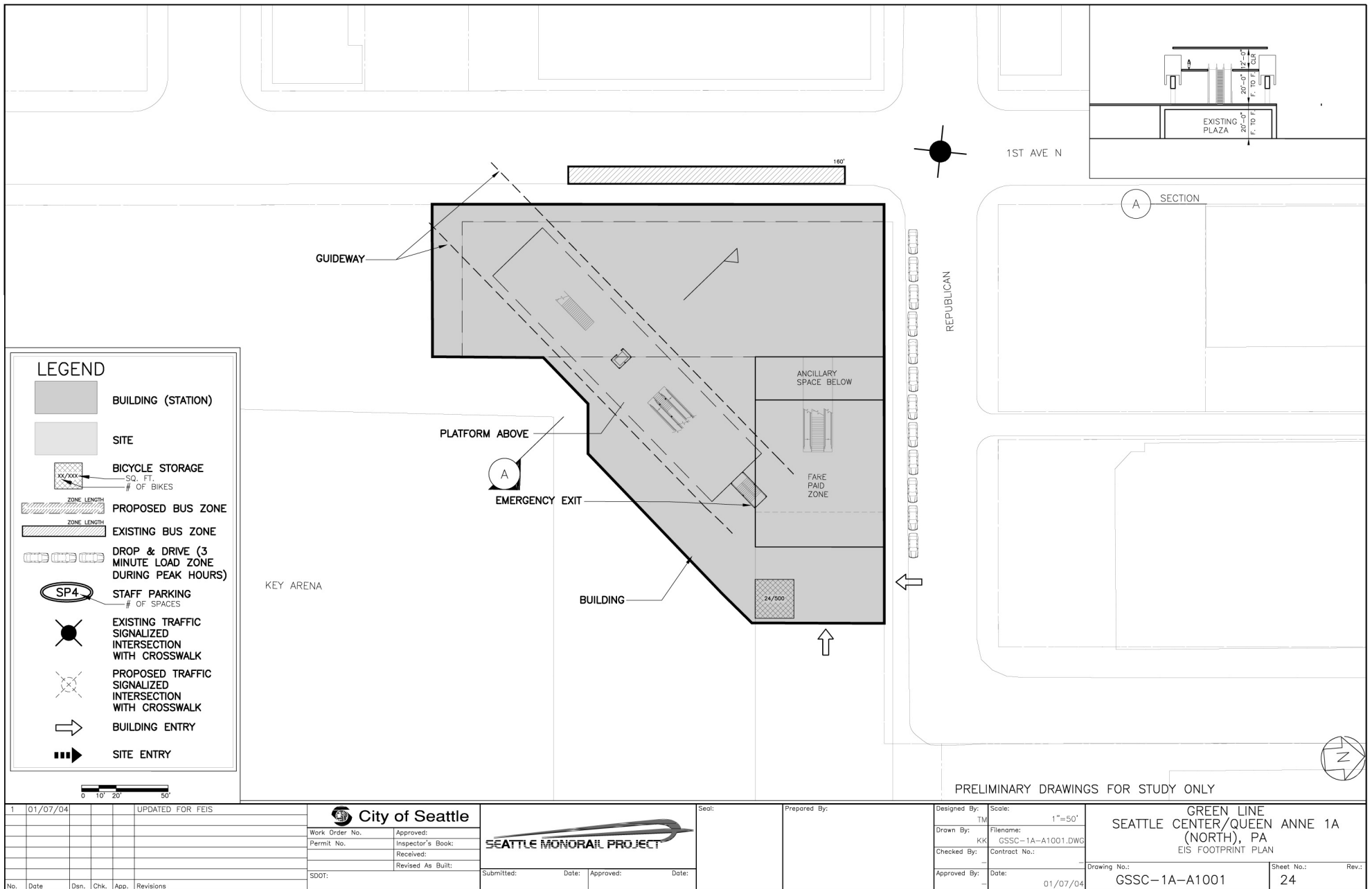
Note: Conceptual site plan for environmental impact review only. Actual design of station will vary, and may involve less or somewhat different property than depicted.

Figure 3-16
Preferred Alternative Howe Station
(Howe 1A, Blaine)



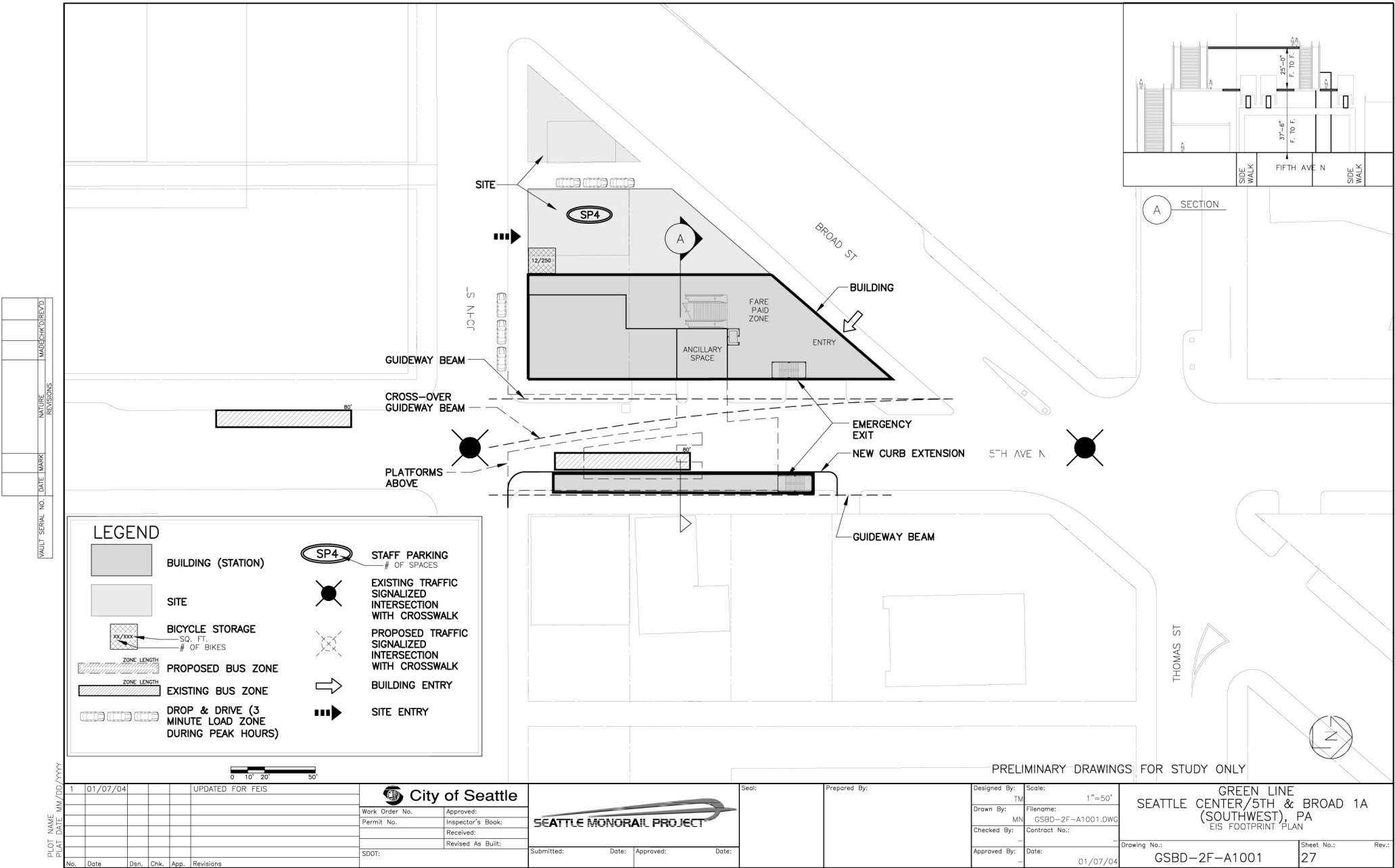
Note: Conceptual site plan for environmental impact review only. Actual design of station will vary, and may involve less or somewhat different property than depicted.

Figure 3-17
Preferred Alternative Elliott and Mercer Station
(Elliott and Mercer 1A, Center)



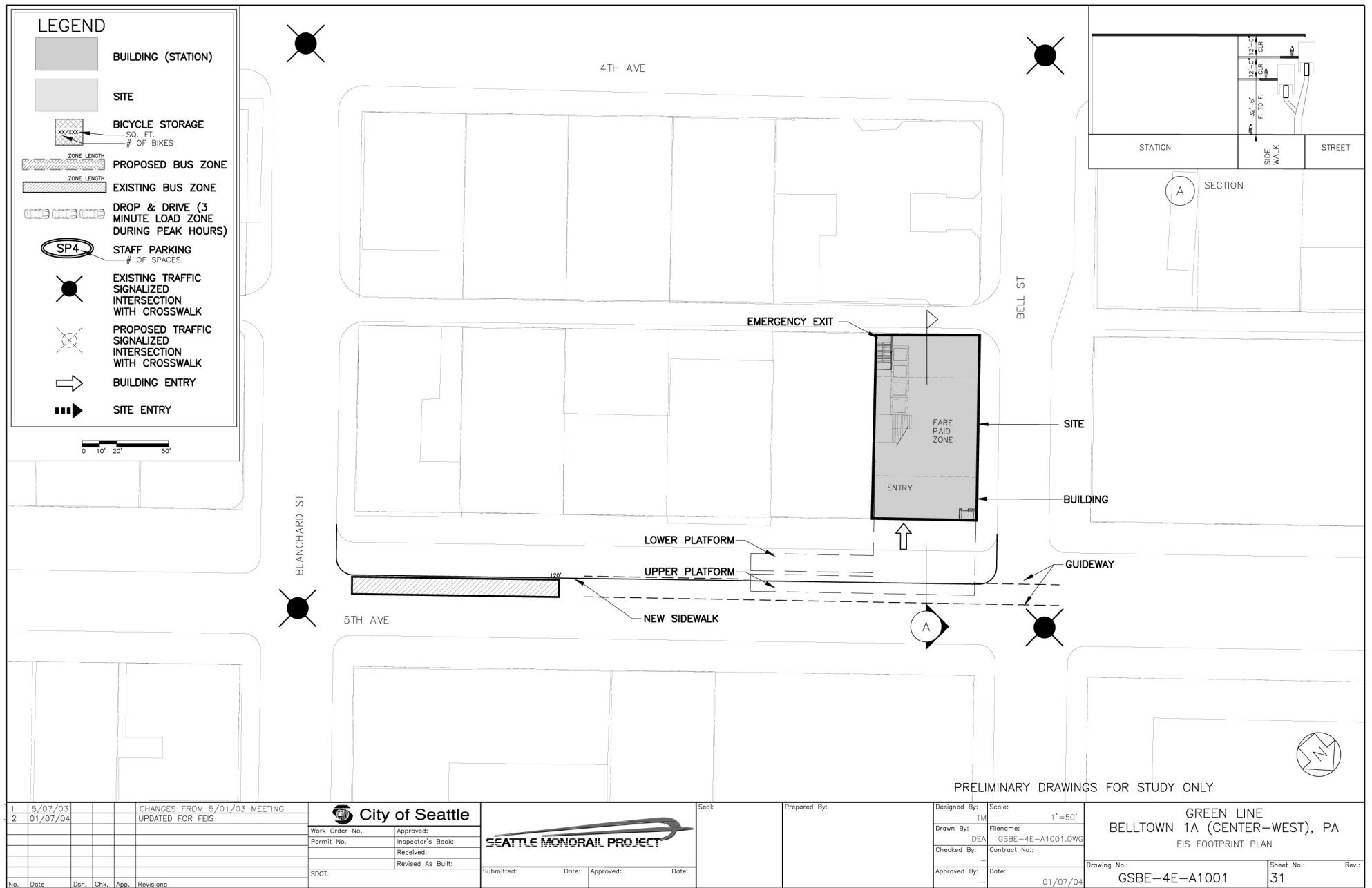
Note: Conceptual site plan for environmental impact review only. Actual design of station will vary, and may involve less or somewhat different property than depicted.

Figure 3-18
Preferred Alternative Seattle Center/
Queen Anne Station
(Seattle Center/Queen Anne 1A, North)



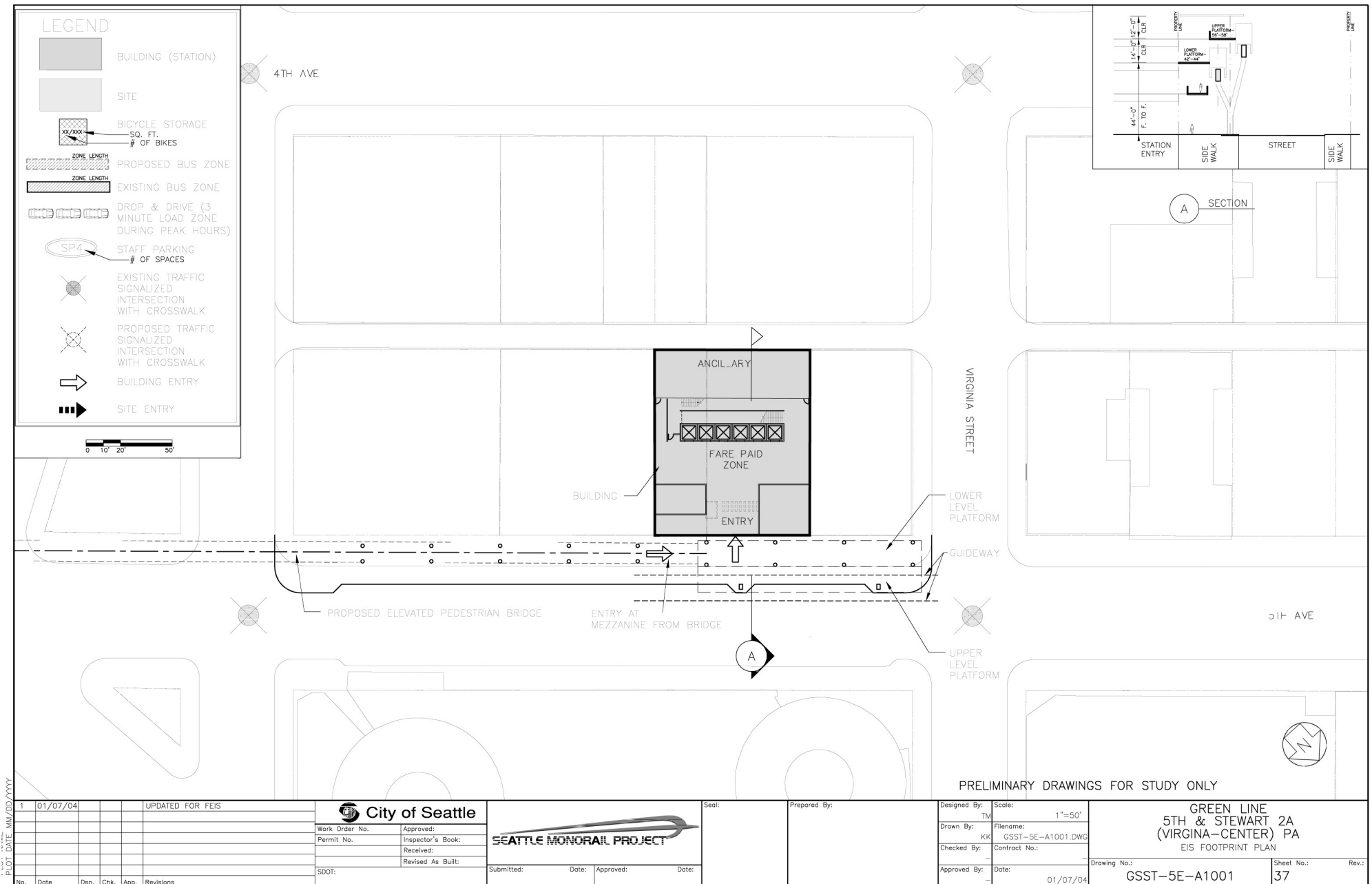
Note: Conceptual site plan for environmental impact review only. Actual design of station will vary, and may involve less or somewhat different property than depicted.

Figure 3-19
Preferred Alternative Seattle Center/5th and Broad Station
(Seattle Center/5th and Broad 1A, Southwest)



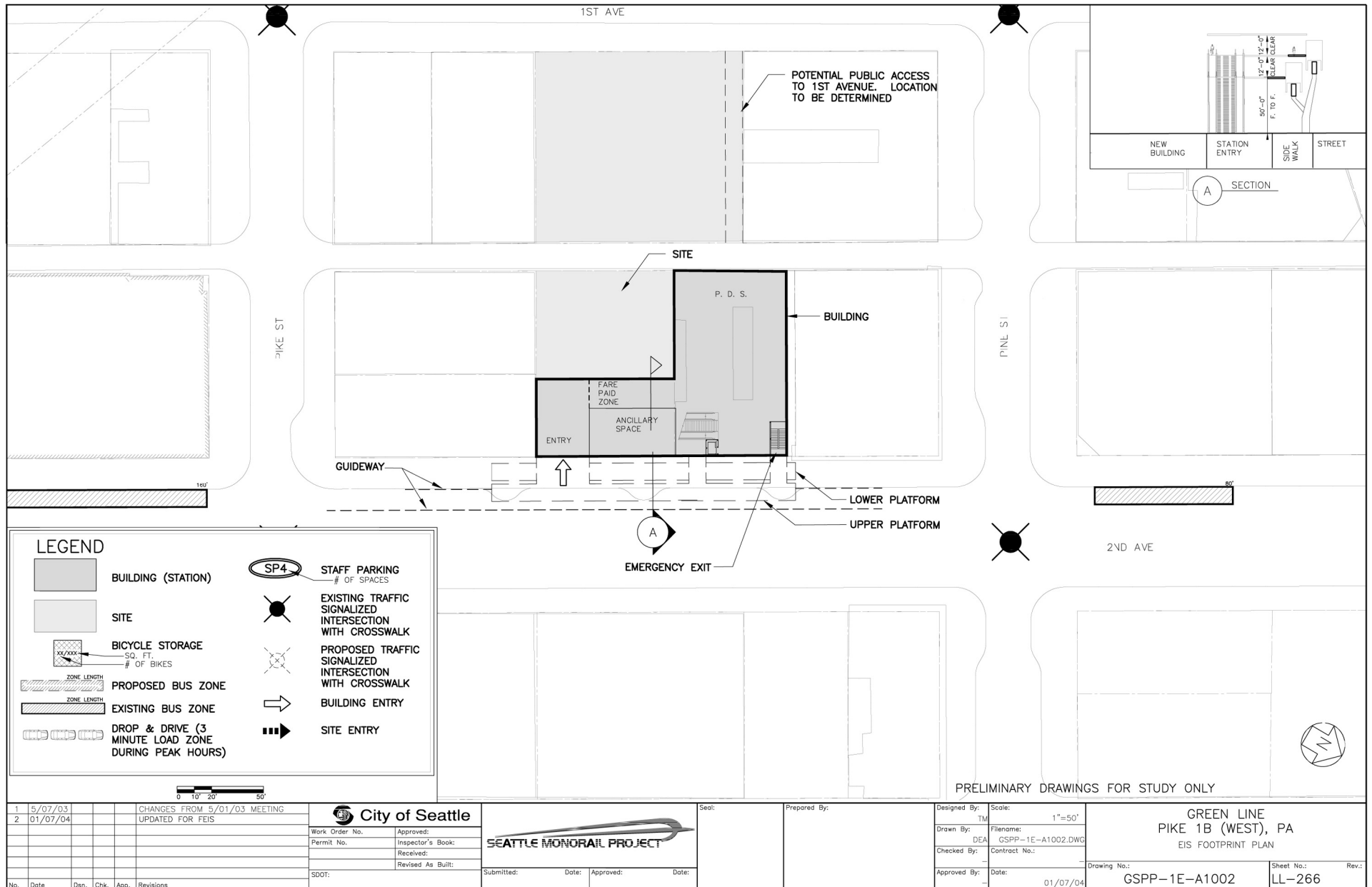
Note: Conceptual site plan for environmental impact review only. Actual design of station will vary, and may involve less or somewhat different property than depicted.

Figure 3-20
Preferred Alternative Belltown Station
(Belltown 1A, Center-West)



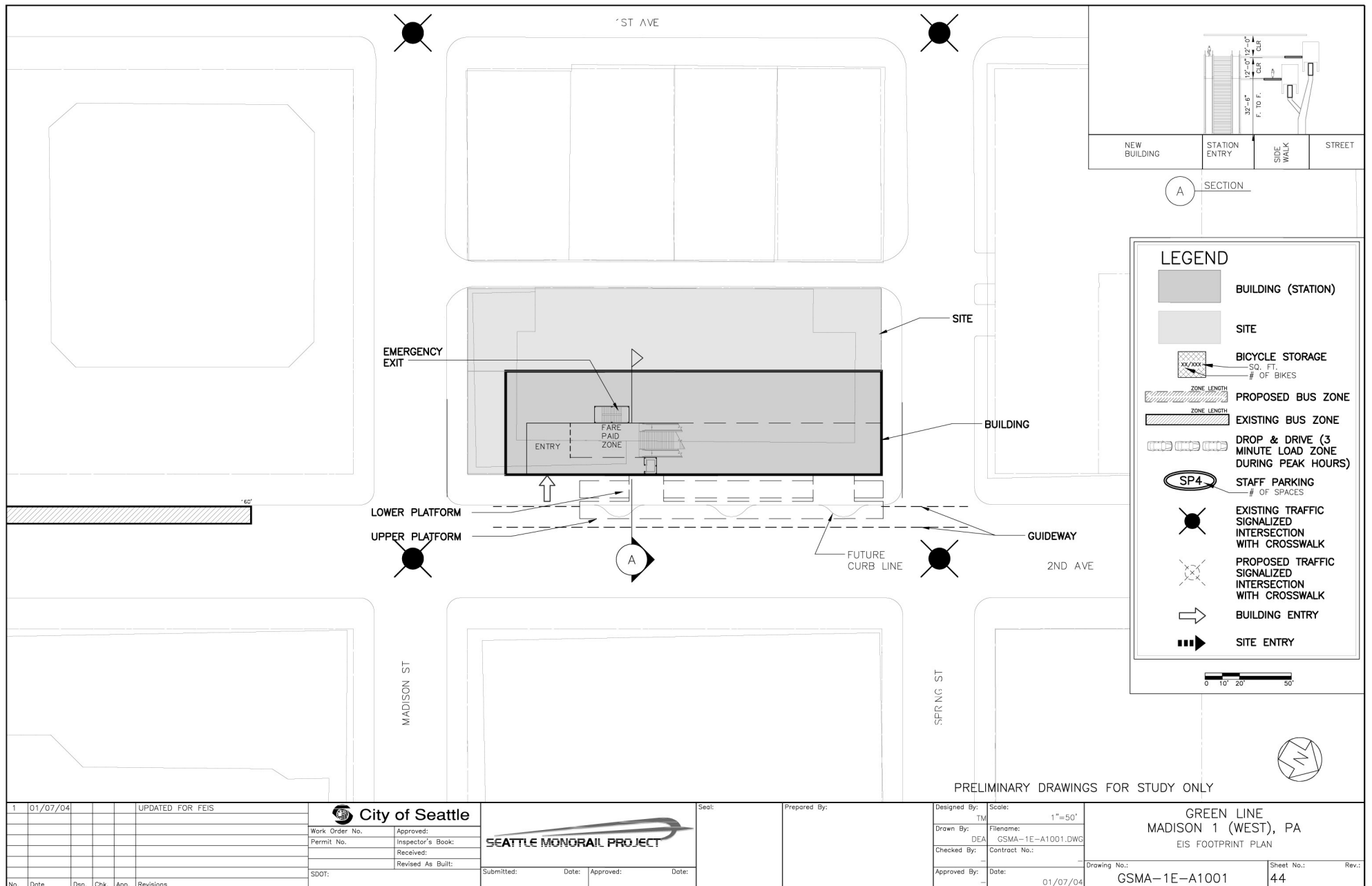
Note: Conceptual site plan for environmental impact review only. Actual design of station will vary, and may involve less or somewhat different property than depicted.

Figure 3-21
Preferred Alternative 5th and Stewart Station
(5th and Stewart 2A, Virginia-Center)



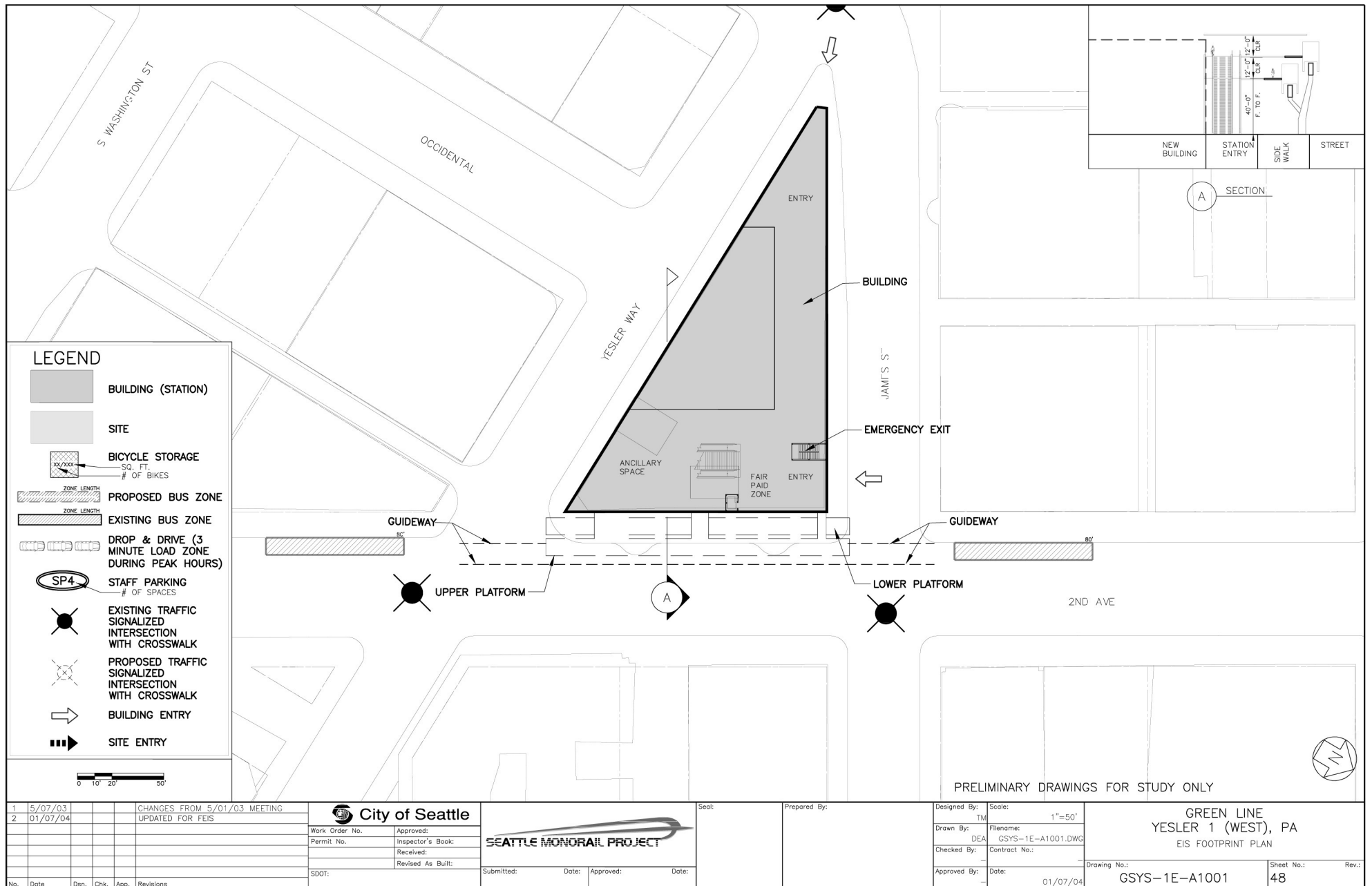
Note: Conceptual site plan for environmental impact review only. Actual design of station will vary, and may involve less or somewhat different property than depicted.

Figure 3-22
Preferred Alternative Pike Station
(Pike 1B, West)



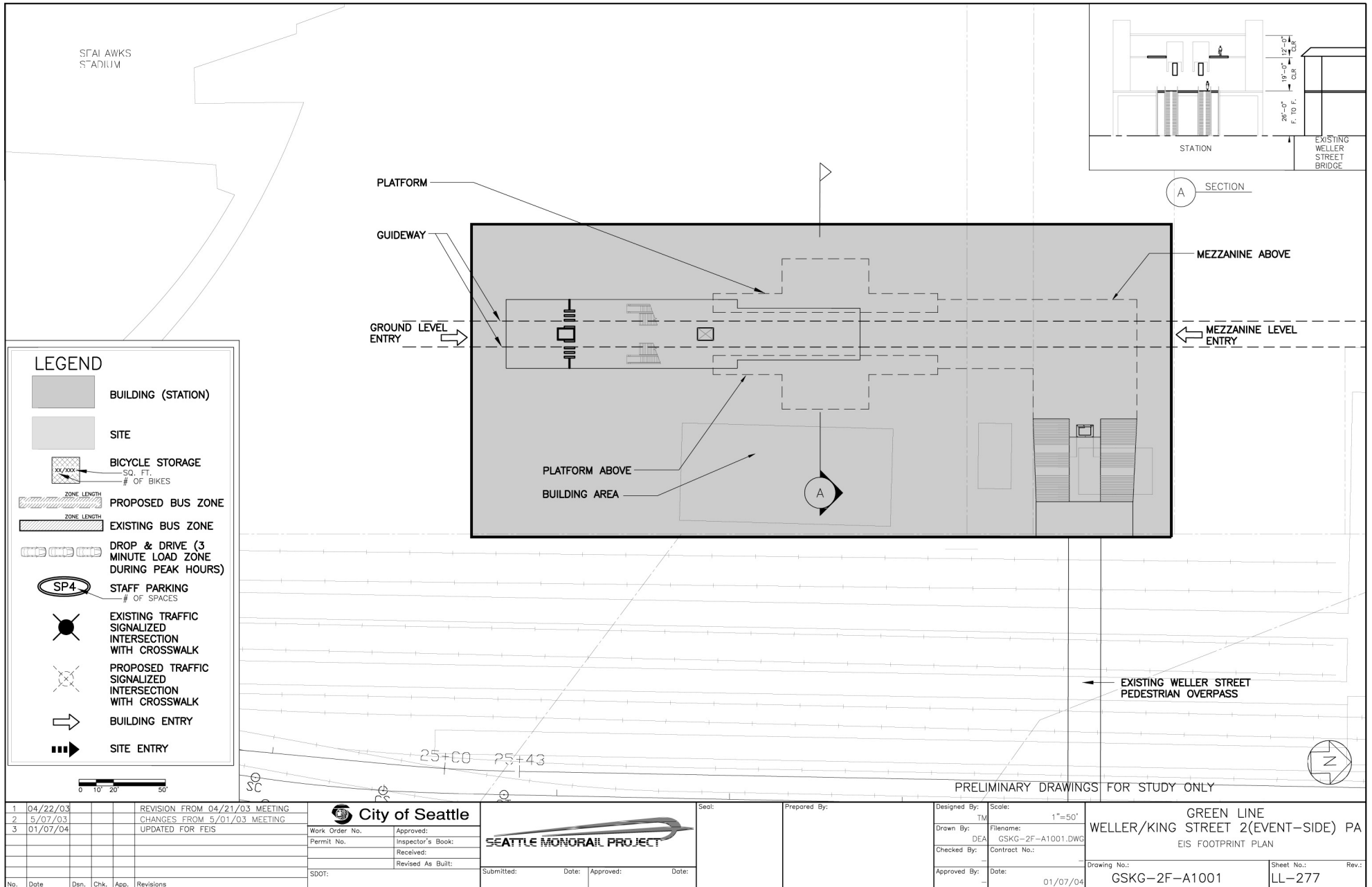
Note: Conceptual site plan for environmental impact review only. Actual design of station will vary, and may involve less or somewhat different property than depicted.

Figure 3-23
Preferred Alternative Madison Station
(Madison 1, West)



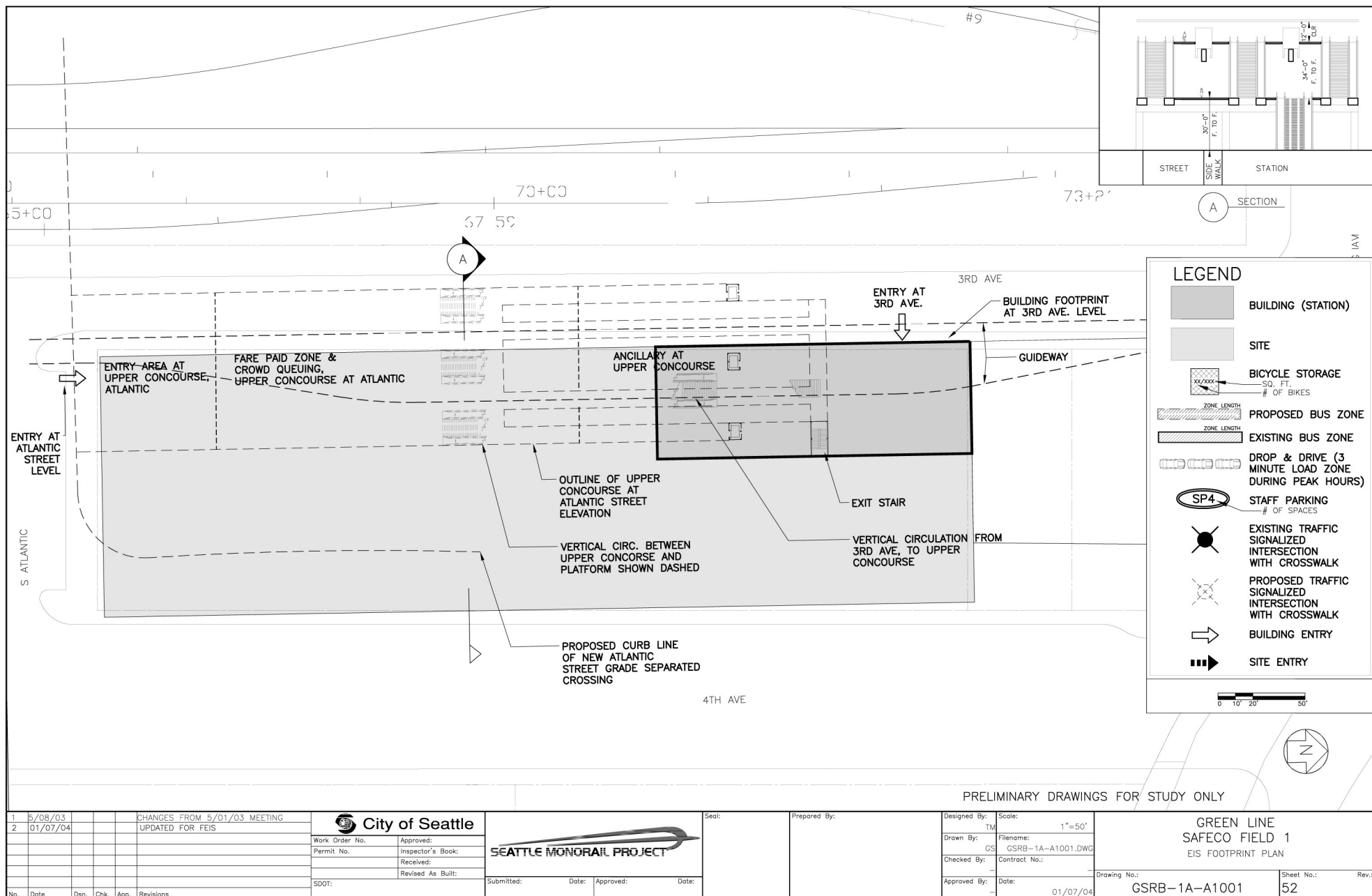
Note: Conceptual site plan for environmental impact review only. Actual design of station will vary, and may involve less or somewhat different property than depicted.

Figure 3-24
Preferred Alternative Yesler Station
(Yesler 1, West)



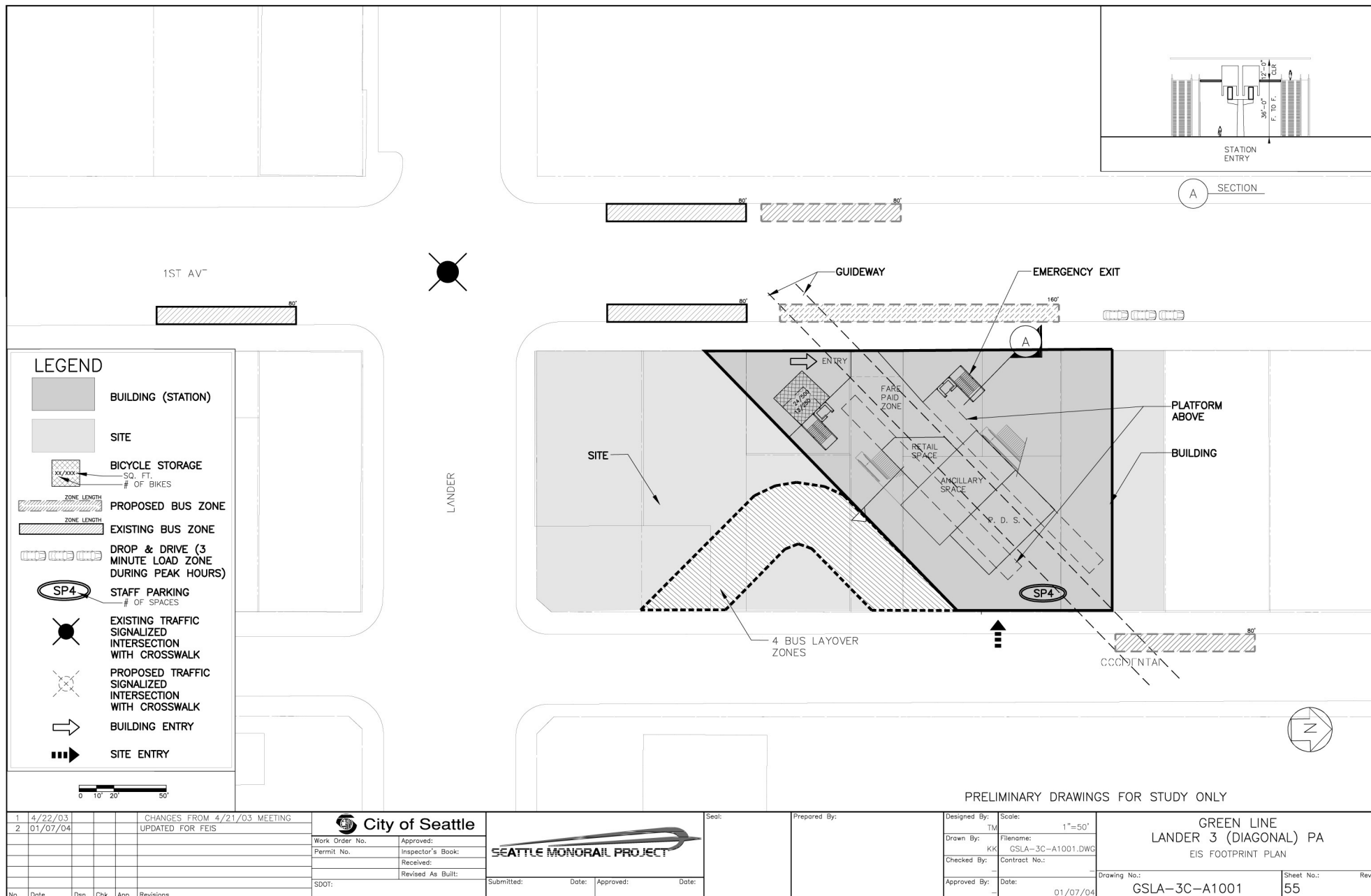
Note: Conceptual site plan for environmental impact review only. Actual design of station will vary, and may involve less or somewhat different property than depicted.

Figure 3-25
Preferred Alternative Weller/King Street Station
(Weller/King Street 2, Event-Side)



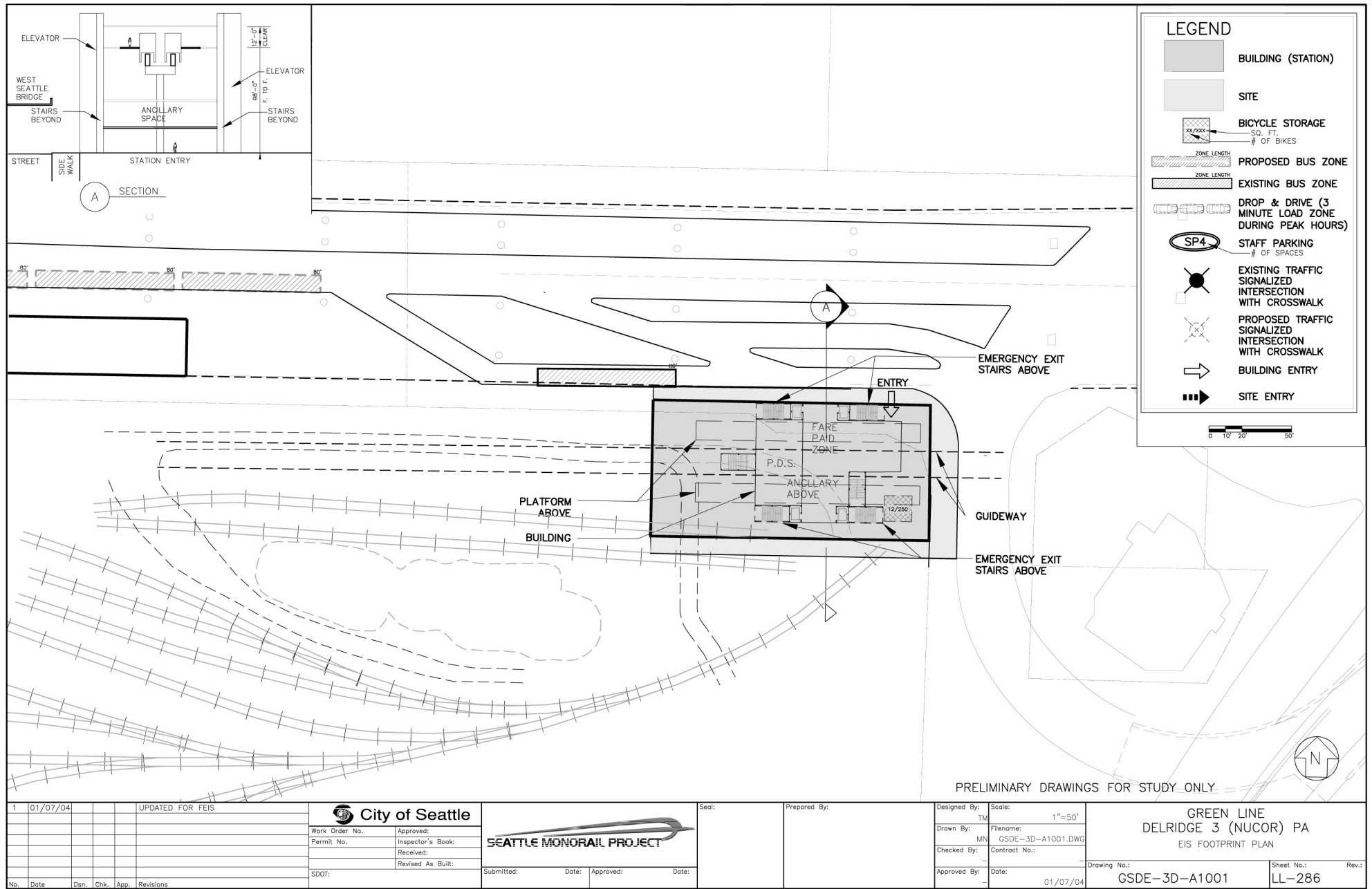
Note: Conceptual site plan for environmental impact review only. Actual design of station will vary, and may involve less or somewhat different property than depicted.

Figure 3-26
Preferred Alternative Safecho Field Station
(Safecho Field 1)



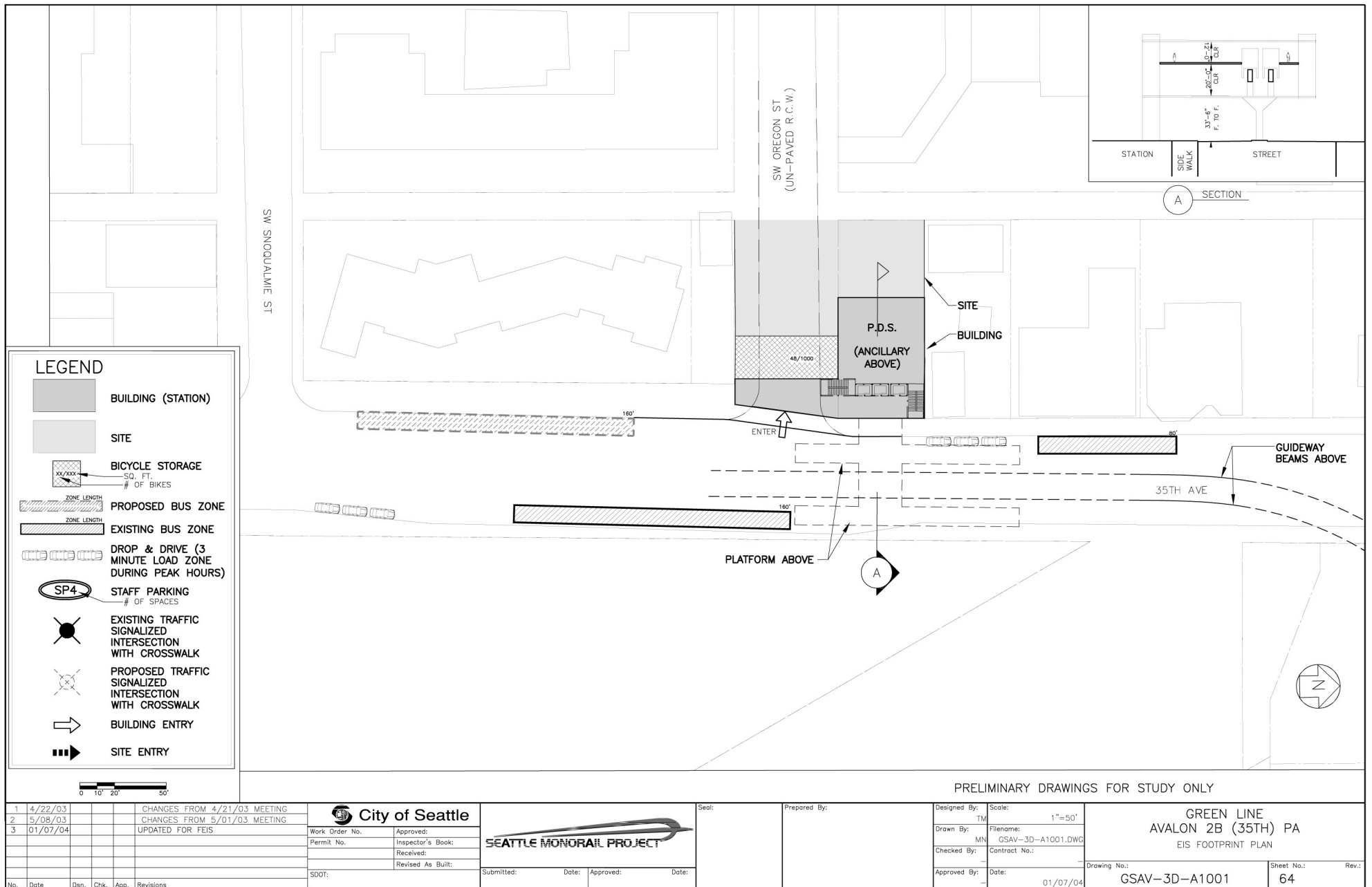
Note: Conceptual site plan for environmental impact review only. Actual design of station will vary, and may involve less or somewhat different property than depicted.

Figure 3-27
Preferred Alternative Lander Station
(Lander 3, Diagonal)



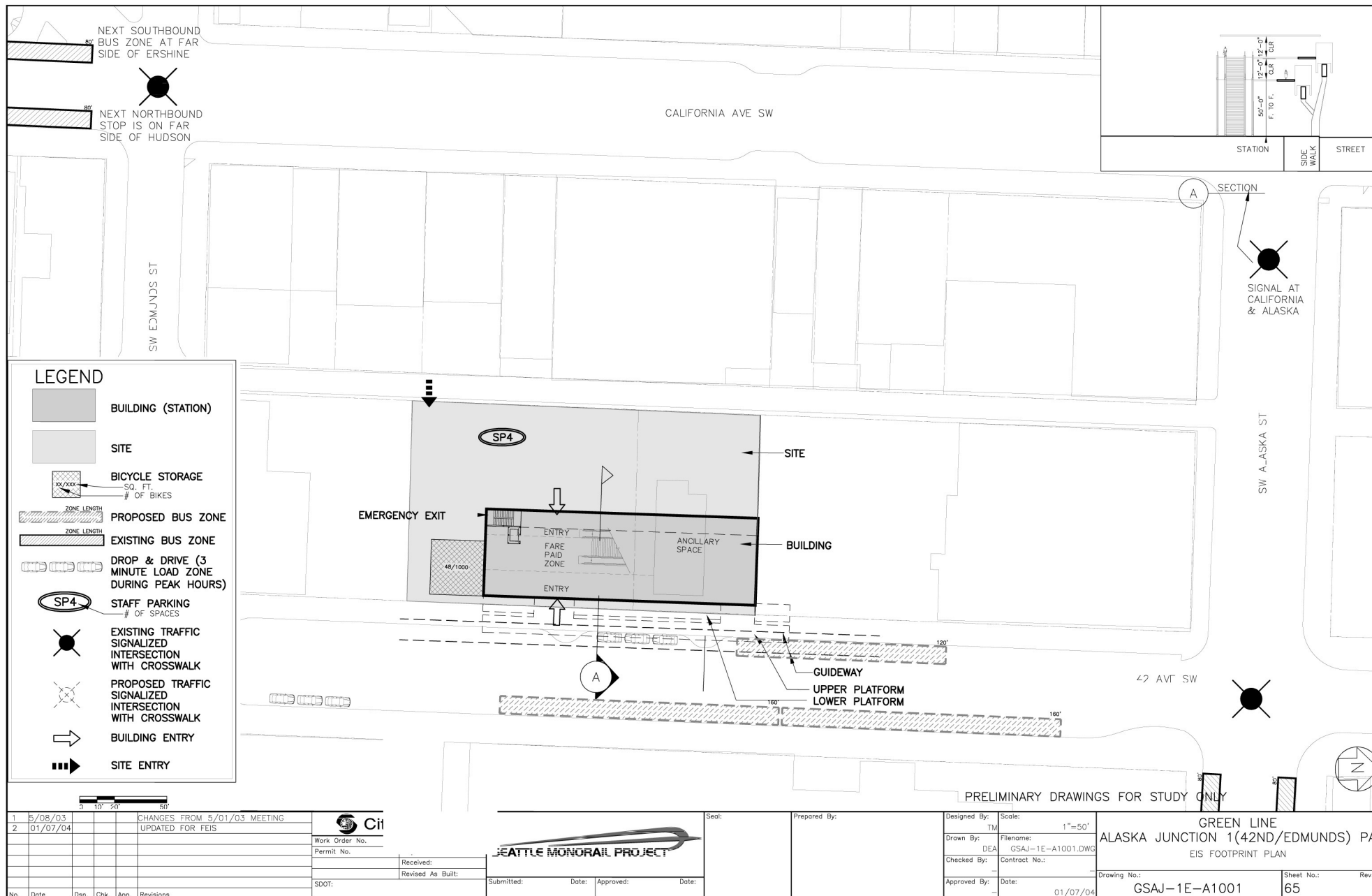
Note: Conceptual site plan for environmental impact review only. Actual design of station will vary, and may involve less or somewhat different property than depicted.

Figure 3-28
Preferred Alternative Delridge Station
(Delridge 3, Nucor)



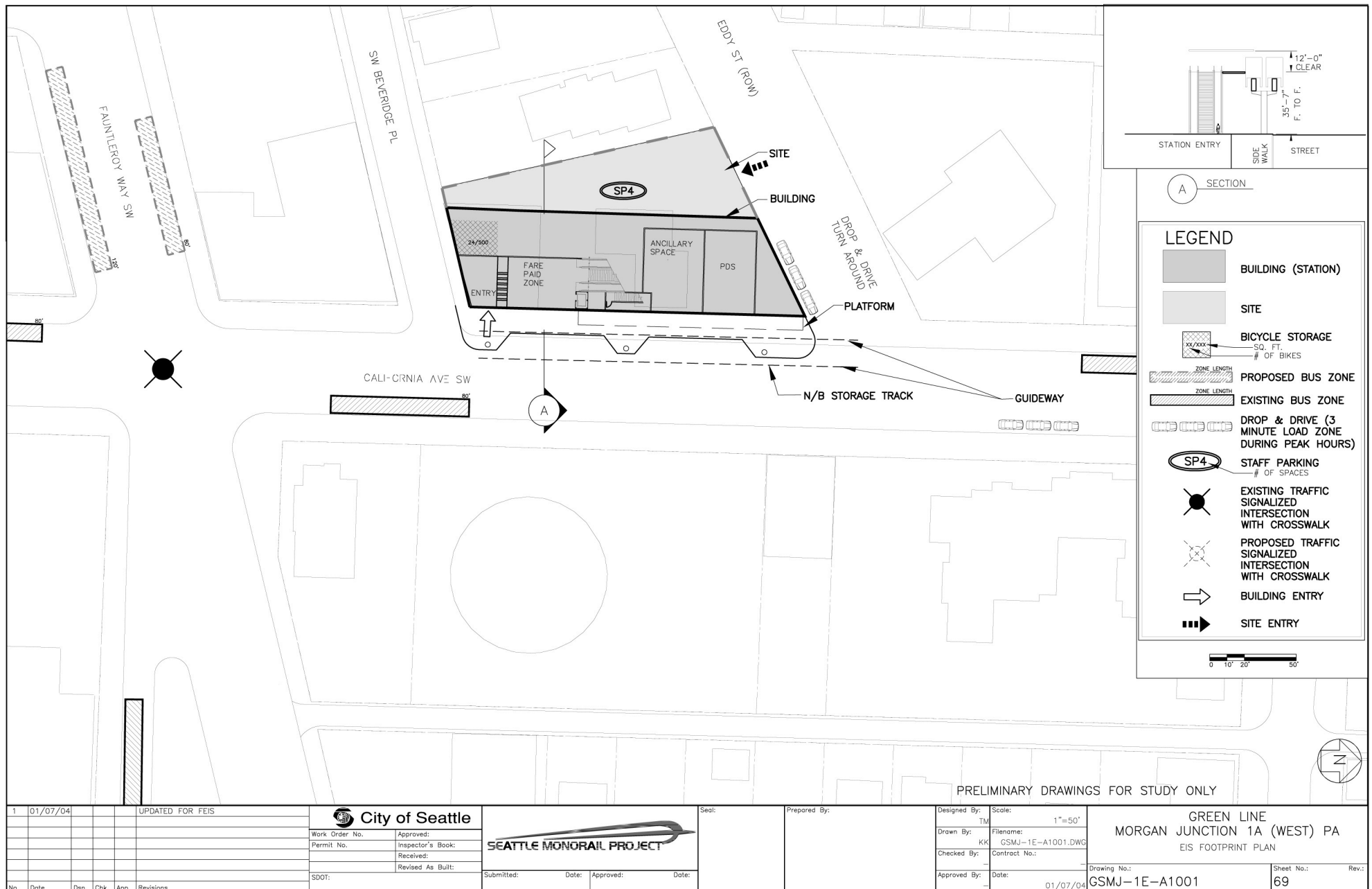
Note: Conceptual site plan for environmental impact review only. Actual design of station will vary, and may involve less or somewhat different property than depicted.

Figure 3-29
Preferred Alternative Avalon Station
(Avalon 2B, 35th)



Note: Conceptual site plan for environmental impact review only. Actual design of station will vary, and may involve less or somewhat different property than depicted.

Figure 3-30
Preferred Alternative Alaska Junction Station
(Alaska Junction 1, 42nd/Edmunds)



Note: Conceptual site plan for environmental impact review only. Actual design of station will vary, and may involve less or somewhat different property than depicted.

Figure 3-31
Preferred Alternative Morgan Junction Station
(Morgan Junction 1A, West)

3.9 PREFERRED ALTERNATIVE

As noted above in Section 3.8, SMP staff developed a Preferred Alternative for evaluation in this Final EIS to indicate their staff recommendation to the SMP Board. The Preferred Alternative for each section is identified alone on Figures 3-32 to 3-36, but was also indicated in conjunction with other alternatives considered in this Final EIS in Figures 3-6 to 3-10.

The Preferred Alternative does not represent action by the SMP Board. Rather, it is presented to share staff's recommendation following extensive environmental, engineering, operational, and design analysis, and a comprehensive public involvement process.

Mitigation measures for all alternatives are outlined in Chapter 5, and have been developed in somewhat more detail for the Preferred Alternative to provide a clear sense of the type and magnitude of mitigation measures that could be implemented. Analysis for all areas of the environment, however, as detailed in Sections 4.1 through 4.17 was conducted at the same level of detail for the Preferred Alternative and for all other alternatives.

The Preferred Alternative is described above within each geographic segment. It is described below for the entire Green Line alignment.

3.9.1 Ballard

In Ballard, the Preferred Alternative includes a single beam alignment along the west side of 15th Avenue NW serving a Ballard Crossing just west of the existing Ballard Bridge. Preferred Alternative alignment and station locations in Ballard are:

Crown Hill Station

The recommended station at Crown Hill is a terminus station near the southwest corner of NW 85th Street and 15th Avenue NW (designated Crown Hill 1A (West, 85th) in this EIS). This station alternative was selected because use of a single platform terminus station will meet passenger demand with a design that is compact and in scale with the surrounding neighborhood, while allowing for the possibility of expansion in the future. The station's location south of the intersection will allow convenient access for Metro buses and will avoid spanning the intersection.

15th Avenue NW Alignment

Along 15th Avenue NW, a single beam configuration on the west side of the street is recommended between the Crown Hill and NW Market stations (Alternative 1.1(s)). The west side alignment is recommended because it will allow freer traffic movement during peak hours, will make left-turn access into businesses easier and will retain more on-street parking than a center alignment. Although a west side alignment will result in potential noise impacts to a larger number of residences than a center alignment, these impacts will be reduced with the use of the recommended single beam configuration.

NW 65th Street Station

The NW 65th Street Station is recommended to be a side platform station on the southwest corner of NW 65th Street and 15th Avenue NW (NW 65th 1B (West)). This station location will provide convenient access to Ballard High School and the surrounding commercial and residential neighborhood, while minimizing impacts to Ballard High School. Switches located north and south of the station will facilitate a transition in and out of a single beam configuration.

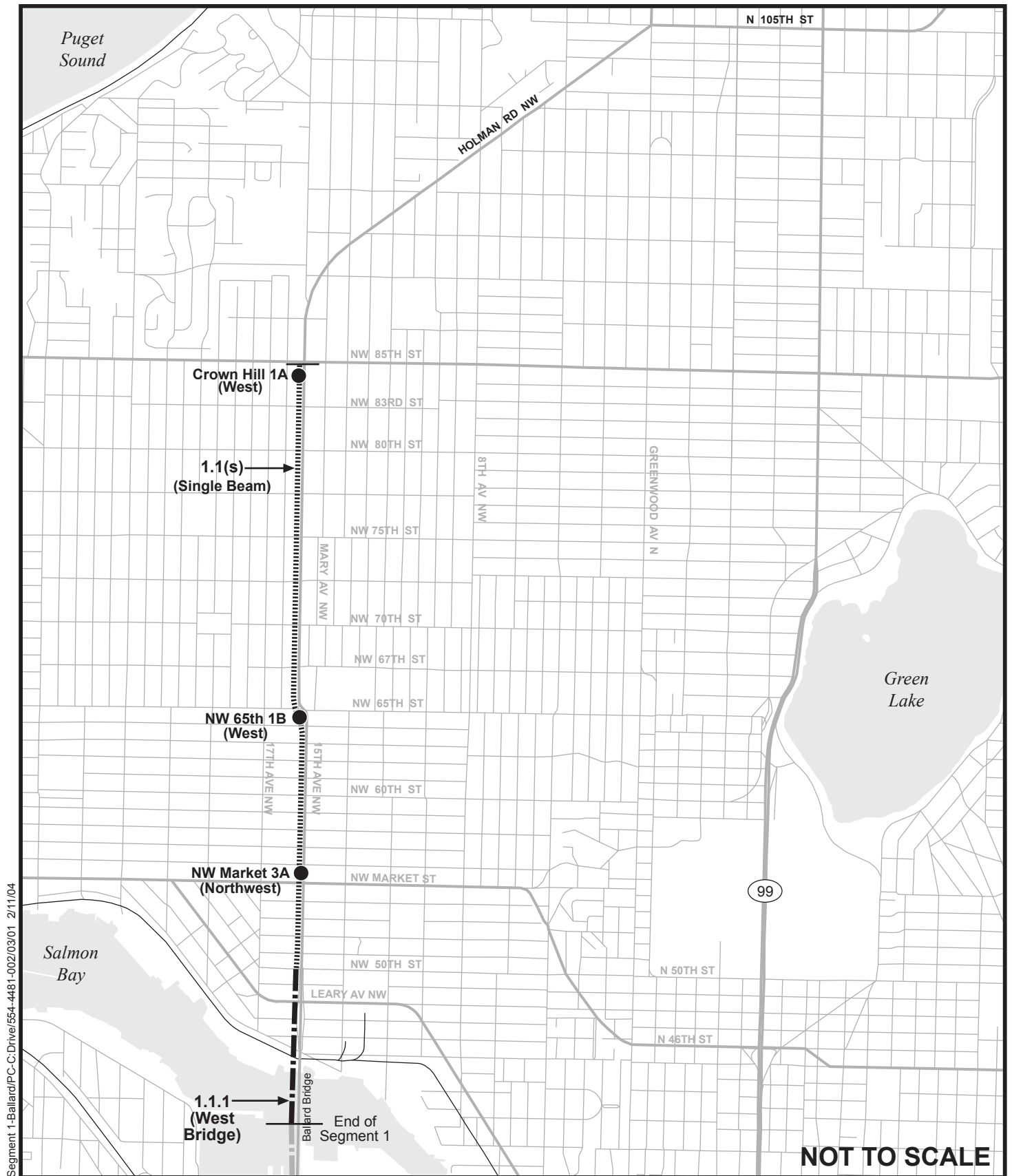
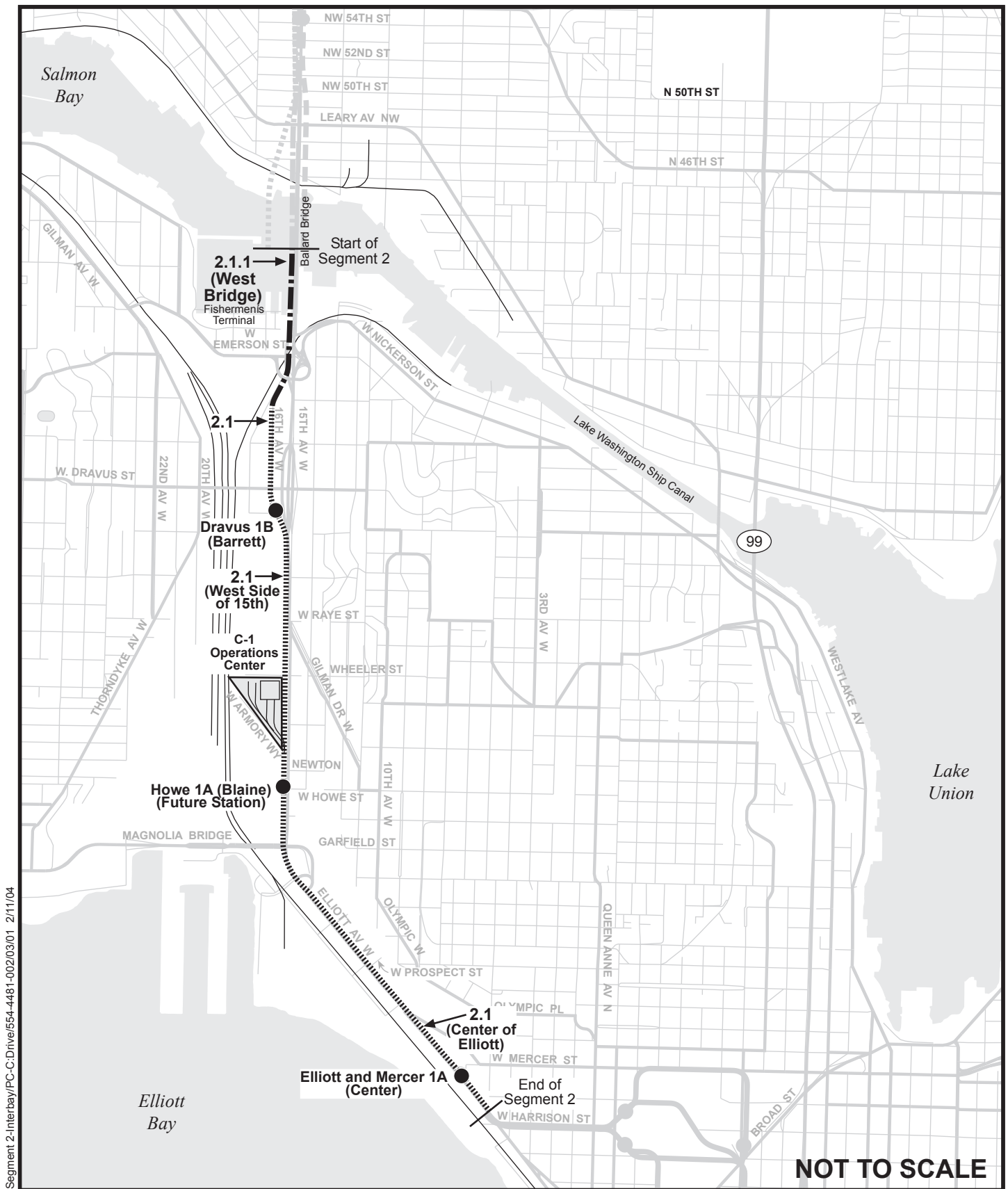


Figure 3-32
Segment 1: Ballard
Final EIS
Preferred Alternative



Segment 2-Interbay/PC-C:Drive/654-4481-002/03/01 2/11/04

SEATTLE MONORAIL PROJECT



Figure 3-33
Segment 2: Interbay/Magnolia
Final EIS
Preferred Alternative

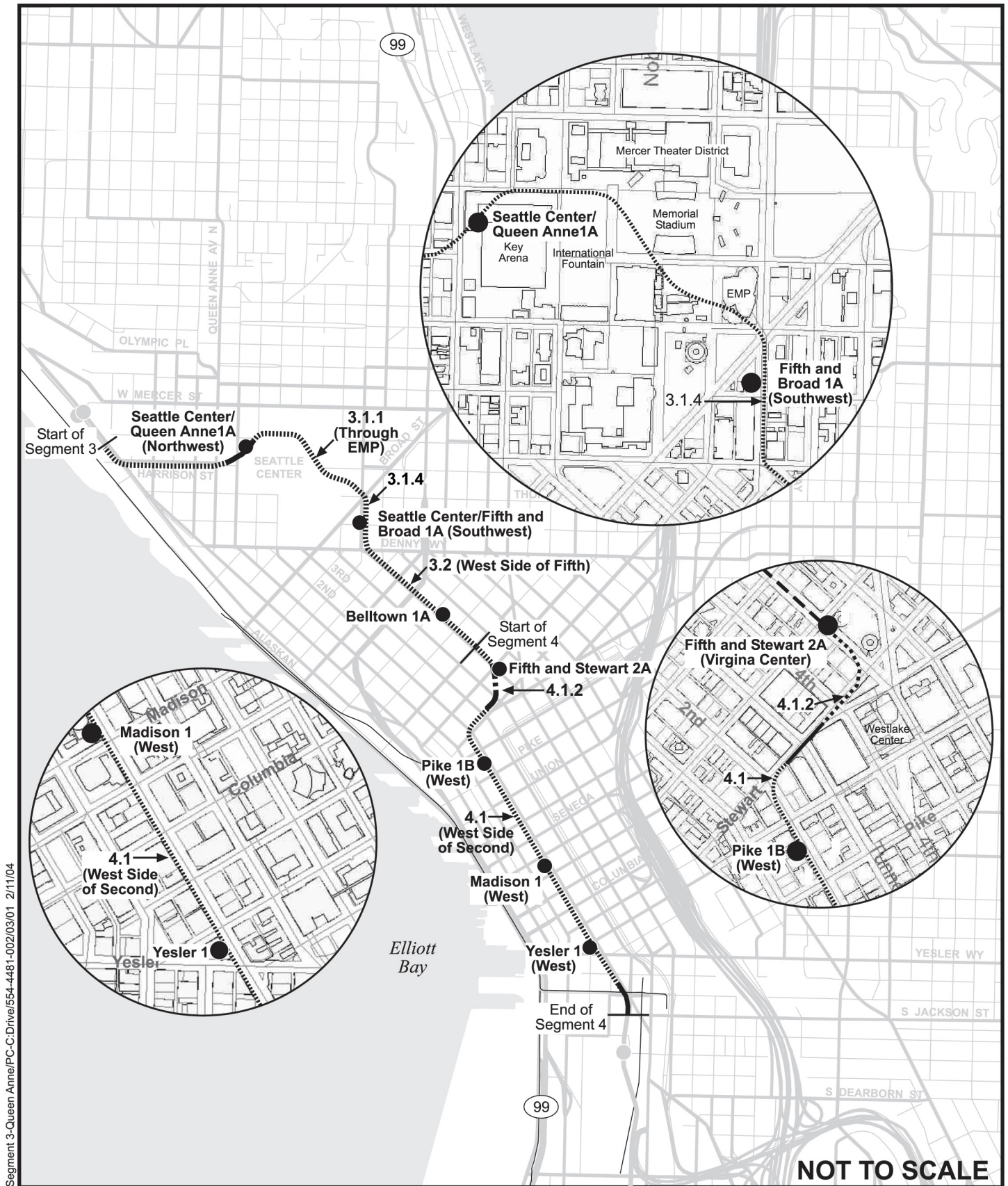
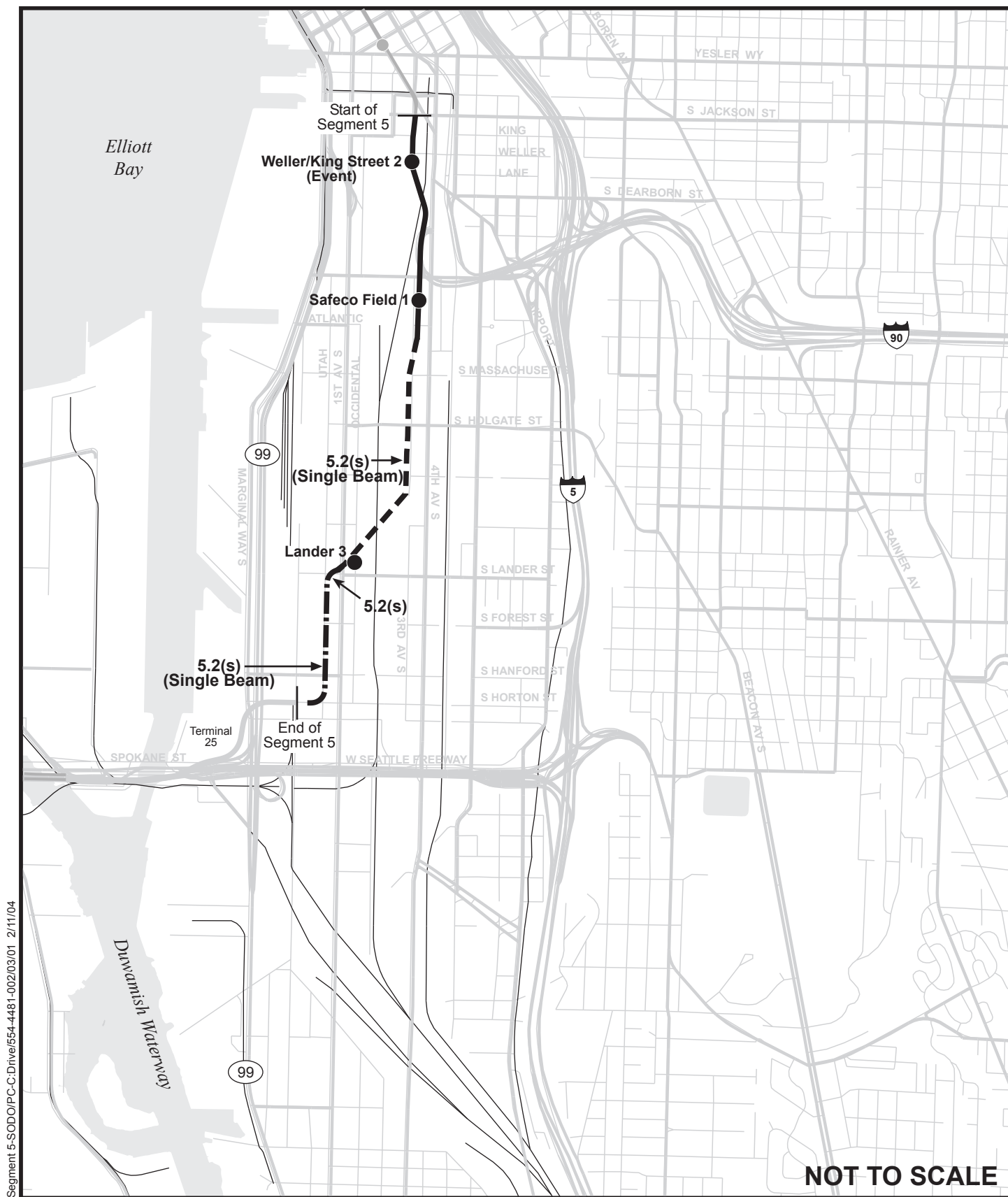


Figure 3-34
Segments 3 and 4: Queen Anne/
Seattle Center/Belltown and
Downtown/Pioneer Square
Final EIS
Preferred Alternative





**Figure 3-36
Segment 6: West Seattle
Final EIS
Preferred Alternative**

NW Market Street Station

The NW Market Street Station is recommended to be a vertical station at the northwest corner of NW Market Street and 15th Avenue NW (NW Market 3A (Northwest)). This station location will provide convenient bus transfers. A switch location north of the station will facilitate a transition from a single beam configuration to a vertical dual beam configuration. A vertical station in this location will complement the surrounding urban design context.

Ballard Crossing

The Ballard Crossing will be a modified box girder, dual beam Monorail-only bridge across the Lake Washington Ship Canal located just west of the existing Ballard Bridge (Alternative 1.1.1). A crossing west of the Ballard Bridge will correspond to the recommended Green Line alignment on the west side of 15th Avenue NW in Ballard and 15th Avenue W in Interbay without the need to cross back and forth across the street. This location was chosen because it would require fewer business displacements. Adequate separation will be provided to allow the existing Ballard Bridge flexibility for possible future expansion. The proposed box-girder structure with the dual guideway spans as noted above would have smaller columns and less total structure above the water than other bridge types. In response to community comments on the Draft EIS, it would also provide the lowest profile along the length of the crossing and reduce view impacts from surrounding neighborhoods, provide sufficient navigational clearance (an envelope height of 120 to 125 feet over the entire width of the navigation channel), minimize construction costs and duration, and help limit the possible construction impacts to users of the maritime environment, including tribal fisheries.

3.9.2 Interbay/Magnolia

In Interbay, the Preferred Alternative includes a dual beam alignment along the west side of 16th and 15th Avenues W and along the center of Elliott Avenue W, with switches to allow trains to transfer in and out of an Operations Center located near W Armory Way. Specific alignment and station locations included in the Preferred Alternative in Interbay are:

16th Avenue W and 15th Avenue W Alignments

A horizontal, dual beam guideway is recommended on the west side of 16th Avenue W north of W Dravus Street and on the west side of 15th Avenue W south of W Dravus Street (Alternative 2.1). Locating the guideway on the west side of 16th Avenue W north of W Dravus Street will provide better bus connections and pedestrian access to a station on Dravus, and will also require fewer business displacements and result in lower traffic impacts than an alignment on 15th Avenue W. South of Dravus, a west side alignment along 15th Avenue W will provide better left turn and traffic movement.

Dravus Station

For the Dravus Station, a side platform station is recommended to be located between 15th and 16th Avenues W, mid-block between West Barrett and West Dravus Streets (Dravus 1B (Barrett)). This station location was evaluated based on comments received following the release of the Draft EIS. The recommended station location will provide improved pedestrian access, bus layovers and drop off, and vehicle access from 15th Avenue W than would the other alternatives that were studied. It will also minimize property acquisition, parking loss, business displacements, and construction impacts on the adjacent grocery store, which is a locally important land use.

Operations Center

The Operations Center to house the Monorail's command and control, train maintenance, and headquarters is recommended to be located on approximately seven acres west of 15th Avenue W on a triangular lot north of W Armory Way (Alternative C-1). Locating the Operations Center in Interbay rather than in SODO will require fewer and less complex business relocations, will fit well with the surrounding community, and is estimated to cost \$5 to \$10 million less than the SODO alternative that was studied.

Future Howe/Blaine Station

In the Howe/Blaine area, the guideway will be constructed so that a station could be built to serve potential new development if it occurs. The future station would be located on the west side of 15th Avenue W south of W Blaine Street (Howe 1A (Blaine)). This future station would provide connections to potential new development as well as to a potential Sounder commuter rail station. The W Blaine Street location is recommended to allow the minimum vertical guideway clearances needed to reach the Operations Center.

Elliott Avenue W Alignment

Along Elliott Avenue W, a horizontal, dual beam guideway along the center of the street transitioning to a vertical configuration at the station is recommended (Alternative 2.1). A center alignment is recommended here rather than a west alignment to provide better through-traffic and freight mobility, as well as lower costs (\$5 to \$10 million less), and to allow for the City's planned off-ramp from the Galer Flyover.

Elliott and Mercer Station

At Elliott and Mercer, a vertical station, served by a dual beam guideway that transitions in and out of a vertical configuration at the station is recommended. The station would be located on the east side of Elliott Avenue W between W Mercer and W Republican Streets, with platforms spanning the east side of Elliott Avenue W to meet the guideway (Elliott and Mercer 1A (Center)). A station on the east side of the street is recommended to serve the nearby residential and office developments along Elliott Avenue W and Queen Anne Hill.

3.9.3 Queen Anne/Seattle Center/Belltown

In the Seattle Center area, the Preferred Alternative includes the "Northwest Route" through the Center to serve the diverse and vibrant activities at the Center. Stations located near Key Arena, Fifth and Broad, and Bell Street would serve event-goers, shoppers, tourists, and residents. Specific alignment and station locations included in the Preferred Alternative in this area are:

W Harrison Street Alignment

Along W Harrison Street, a horizontal, dual beam guideway on the south side of the street is recommended (Alternative 3.1). A south side alignment would require less property acquisition for the turns from Elliott Avenue W and into Seattle Center, would allow a lower height guideway and minimize the need for air rights, and would have fewer impacts on this narrow street than would a north side alignment because there are fewer buildings on the south side.

Queen Anne/Seattle Center Station

A center platform station is recommended near the northwest corner of Key Arena east of First Avenue N in the area currently occupied by the Northwest Rooms (Seattle Center/Queen Anne 1A (North)). This

location is recommended to provide easy access from both Seattle Center and the surrounding community, while providing capacity for event crowds.

Seattle Center-Area Alignment

The “Northwest Route” with a horizontal, dual beam guideway is recommended to travel through Seattle Center along the paved path of Republican Street, along the west end of Memorial Stadium, over the Fun Forest, and through the Experience Music Project (Alternative 3.1 through Center, Alternative 3.1.1 through EMP, Alternative 3.1.4 approaching Fifth and Broad Station). This route is recommended in response to community comments, to minimize impacts on local businesses and to traffic flow, and to maximize consistency with local land uses. The recommended route would also reduce travel times over other alternatives that were evaluated.

Fifth and Broad Station

An event/turnback station with switches for a Downtown Turnback is recommended to be located on Fifth Avenue N between John and Broad Streets (Seattle Center/Fifth and Broad 1A). This station location would provide convenient pedestrian connections to Seattle Center and easy access for Belltown residents. It would require fewer business displacements than other alternatives that were studied. It would include switches for a Downtown Turnback for more frequent service through the Downtown area.

Fifth Avenue Alignment

Along Fifth Avenue through Belltown, a west side alignment with a horizontal, dual beam guideway transitioning to a vertical alignment at the Bell Street Station and remaining vertical until after the Fifth and Stewart station is recommended (Alternative 3.2.1). A west alignment will increase traffic mobility, compared to a center alignment, for which the City would require a continuous median that would isolate lanes on either side of the guideway and restrict turns between lanes and into driveways and side streets. A west alignment will also allow a wider west side sidewalk and increased pedestrian activity and, possibly, a bicycle lane.

Bell Street Station

A vertical station is recommended on the west side of Fifth Avenue south of the intersection with Bell Street (Belltown 1A (Center-West). This station location is recommended to provide convenient pedestrian access for Belltown residents and shoppers, while minimizing business displacements and impacts to nearby properties.

3.9.4 Downtown/Pioneer Square

Downtown, the Preferred Alternative includes a dual beam alignment along the west side of Second Avenue that will transition between a horizontal configuration between stations and a vertical configuration at stations. The horizontal configuration between stations is recommended to minimize view impacts. The vertical configuration at stations is recommended to minimize traffic impacts, as it will allow stations to be built off the right-of-way. Stations are recommended at Fifth and Stewart, Pike Street, Madison Street, and Yesler Way. Specific alignment and station locations included in the Preferred Alternative for Downtown are:

Fifth and Stewart Station

A vertical station is recommended northwest of the intersection of Fifth Avenue and Stewart Street, served by a dual beam guideway that transitions out of a vertical configuration after the station, with a mezzanine and an elevated pedestrian walkway to Westlake Center (Fifth and Stewart 2A (Virginia Center)). This station location is recommended to provide convenient pedestrian access to the Downtown

retail core and other forms of transit, including the Downtown Seattle Transit Tunnel and a potential Westlake streetcar. It will also avoid the demolition of a historic building and minimize business displacements compared with other alternatives.

Stewart Street Alignment

Along Stewart Street, a horizontal, dual beam guideway is recommended south of the center of the street (Alternative 4.1.2). This alignment location will minimize impacts to historic buildings.

Second Avenue Alignment

Along Second Avenue, a horizontal, dual beam guideway on the west side of the street transitioning in and out of a vertical configuration at stations at Pike, Madison, and Yesler is recommended (Alternative 4.1). The EIS studies potential alignments on the west side, east side, center, and east of center of Second Avenue. The west side alignment is recommended because it will provide the smoothest traffic flow with no restrictions on turning movements, less need for utility relocation, less shading to the public open spaces on the east side of the street, and less tree replacement than other alternatives. This alignment would also require less time to construct and be less costly than other alternatives.

Pike Station

A vertical station is recommended on the west side of Second Avenue between Pine and Pike Streets (Pike 1B (West)). This station location is recommended to avoid demolition of a historic building, while providing convenient pedestrian access to Second Avenue and Pike Place Market.

Madison Station

A vertical station is recommended on the west side of Second Avenue between Madison and Spring Streets, on the site of the Federal Reserve Building (Madison 1 (West)). This station location is recommended to provide convenient access to the Downtown office core and the Colman Dock ferry terminal.

Yesler Station

A vertical station is recommended on the west side of Second Avenue at Yesler Way on the site of the “Sinking Ship” garage (Yesler 1 (West)). This station location is recommended to minimize impacts to the historic Smith Tower while providing convenient pedestrian access to Pioneer Square. Although this station location would displace a significant amount of off-street parking, the location would not affect any historic buildings and is supported by Pioneer Square stakeholders.

3.9.5 SODO/Chinatown International District/Pioneer Square

In SODO, the Preferred Alternative includes a single beam configuration south of Safeco Field, with stations at Weller/King, Safeco, and S Lander Street. Specific alignment and station locations included in the Preferred Alternative in SODO are:

Weller/King Alignment

A horizontally arranged guideway between Yesler Way and S Royal Brougham Way is recommended west of King Street Station crossing nearly perpendicular to the railroad tracks south of Seahawks Stadium (Alternative 5.2(s)). This recommended alignment will keep spans across the railroad tracks as short as possible, maintain truck and emergency vehicle access to the stadiums, keep the guideway from restricting future development, and minimize visual impacts to King Street Station.

Weller/King Station

An event/turnback station is recommended south of the S Weller Street Pedestrian Bridge. The station would have switches to the south to accommodate a Downtown Turnback (Weller/King 2 (Event)). This station location is recommended to serve the Chinatown International District and Pioneer Square communities, provide capacity for crowds at both stadiums and the Exhibition Center, and facilitate connections to the Downtown Seattle Transit Tunnel, commuter rail, and Amtrak. A station location to the south of the Weller Street pedestrian overpass will position the station platform farther from the historic King Street Station than other alternatives that were studied. It will minimize interference with planned redevelopment of that site and with the parking lot north of the football stadium, while optimizing connections to other transit modes.

Safeco Station

A side platform station with switches south of the station to allow for a transition to a single beam guideway is recommended on the east side of Safeco Field (Safeco 1). This station location is recommended to provide convenient access for event goers and to provide sufficient vertical clearance over a future overpass of the railroad tracks at S Royal Brougham Way, which could be constructed in conjunction with Washington State Department of Transportation's (WSDOT) SR 519 project.

Third Avenue S Alignment

A single beam guideway is recommended on the west side of Third Avenue S (Alternative 5.2(s)). This alignment is recommended to minimize impacts to traffic flow, maximize access to businesses, ensure that Green Line columns can be located along the street right-of-way in a configuration that would leave adequate clearance from Burlington Northern Santa Fe (BNSF) Railroad tracks and a future planned Sound Transit or BNSF signal bridge, and provide adequate space for truck turning movements. A single beam guideway configuration is recommended to reduce the costs for the special structures needed in this area of the route while still meeting ridership demand.

Lander Alignment

A horizontally arranged guideway diagonal to the street grid and passing to the north of the Seattle Public Schools' headquarters is recommended, with switches to the south and north of the Lander station to allow for the transition between single and double beam guideway (Alternative 5.2(s)). This area of the Preferred Alternative was selected to avoid an area of S Lander Street where the City plans to construct an elevated roadway overpass, minimize travel time, and avoid the need to incorporate two 90-degree turns in the Monorail guideway, which would be required by following the street rights-of-way through the area. The alignment would meet BNSF safety requirements and future plans, and avoid a fiber optic ductbank. The alignment would transition to a double beam configuration in this area to allow trains to pass each other at the Lander station.

Lander Station

A side platform station is recommended north of S Lander Street at an angle to the street grid between First Avenue S and Occidental Avenue S (Lander 3 (Diagonal)). This location is recommended to maximize access to the business and bus hub in the area and to serve employees in the area.

Lander to West Seattle Bridge Alignment

A single beam guideway is recommended on the west side of Utah Avenue S and the north side of S Horton Street, with special structures to provide long spans to facilitate turning movements for large trucks, and with switches located over S Horton Street and Terminal 25 to provide a passing area for trains (Alternative 5.2(s)). The recommended alignment would cross the S Spokane Street overpass (SR-

99) and the southeast corner of Terminal 25. This alignment is recommended to maintain traffic flow and turning movements and maintain access for large trucks serving industrial businesses in the area.

3.9.6 West Seattle

The EIS evaluates a number of different alternatives for alignments and station locations in West Seattle. The Preferred Alternative for this area was developed in response to community comments and ongoing technical work. Specific alignment and station locations included in the Preferred Alternative in West Seattle are:

Duwamish Crossing

To cross the Duwamish River, a single beam guideway is recommended to be located above the center median of the West Seattle Bridge, departing the Bridge near Delridge Way SW after the Pigeon Point Greenbelt, and with switches located at both ends of the Bridge to facilitate the transition in and out of single beam configuration (Alternative 6.1.1(s)). This alignment is recommended to provide a cost-effective and environmentally sensitive crossing of the Duwamish River without affecting traffic flow on the West Seattle Bridge. The single beam configuration will reduce the retrofit needs of the West Seattle Bridge while meeting ridership demand.

Delridge Alignment

In the Delridge area, a single beam guideway is recommended to be located on and immediately north of the Nucor steel plant over the eastbound lanes of SW Spokane Street (Alternative 6.3(s)). Alignment alternatives for this area were updated following the release of the Draft EIS in response to community comments and ongoing technical work. This alignment alternative was selected as the Preferred Alternative because it would minimize traffic and parking impacts, provide better access for trucks and buses, move the guideway and station away from the Longfellow Creek greenspace, and increase access to the Green Line for Admiral and Alki residents compared with other alternatives that were studied. This alternative would not result in any impacts to the Longfellow Creek greenspace.

Delridge Station

A side platform station is recommended on the northeast corner of the steel plant site near Delridge Way SW, with switches to facilitate a transition from the single beam guideway to a dual beam, horizontal guideway (Delridge 3(Nucor)). This location is recommended to serve the updated recommendation for a Delridge alignment that would provide better access for Admiral and Alki residents and avoid impacts to the Longfellow Creek greenspace.

Avalon to Alaska Station

A horizontally arranged guideway is recommended in the center of SW Avalon Way, center of 35th Avenue SW, and north side of SW Alaska Street (Alternative 6.2.2). This alignment is recommended to avoid impacts to West Seattle Stadium Park, allow for bus layover space, and allow for lane widths on 35th Avenue SW that will conform more closely to City standards than the existing substandard lane and parking widths. This alignment will avoid traffic impacts to Fauntleroy Way SW.

Avalon Station

A Side platform station is recommended on the west side of 35th Avenue SW near SW Oregon Street, with platforms serving a center of street guideway (Avalon 2B (35th)). This station location is recommended to avoid impacts to West Seattle Stadium Park, save 40 to 50 significant trees and additional smaller trees, avoid the need to provide replacement property for the park under City

Ordinance, and provide easier pedestrian connections for nearby residents and businesses than a station on the east side of the street.

Alaska Junction Alignment

A horizontally arranged guideway transitioning in and out of a vertical configuration to serve the Alaska Junction station is recommended on the west side of 42nd Avenue SW, turning to California Avenue SW south of SW Edmunds Street (Alternative 6.1). This alignment is recommended to maintain the visual integrity of the Alaska Junction area and avoid crossing the Alaska/California intersection with the guideway, minimize impacts to traffic, and provide maximum transit and pedestrian connections to the businesses, stores, and residences in and near the Junction.

Alaska Junction Station

A vertical station is recommended to be located on the west side of 42nd Avenue SW between SW Alaska and SW Edmunds Streets (Alaska Junction 1 (42nd/Edmunds)). This station location is recommended to provide convenient pedestrian and bus access to the Alaska Junction while minimizing impacts to nearby properties.

California Avenue Alignment

A single beam guideway is recommended along the west side of California Avenue SW, with switches located south of SW Dawson and north of the Morgan Junction station (Alternative 6.1.6(s)). This alignment is recommended to maintain the current left turn lane, provide better access to side streets and businesses along California Avenue SW, and retain more on-street parking than other alternatives. A single beam configuration is recommended to allow a more slender profile for the guideway to complement the surrounding neighborhood while accommodating projected ridership and future growth.

Morgan Junction Station

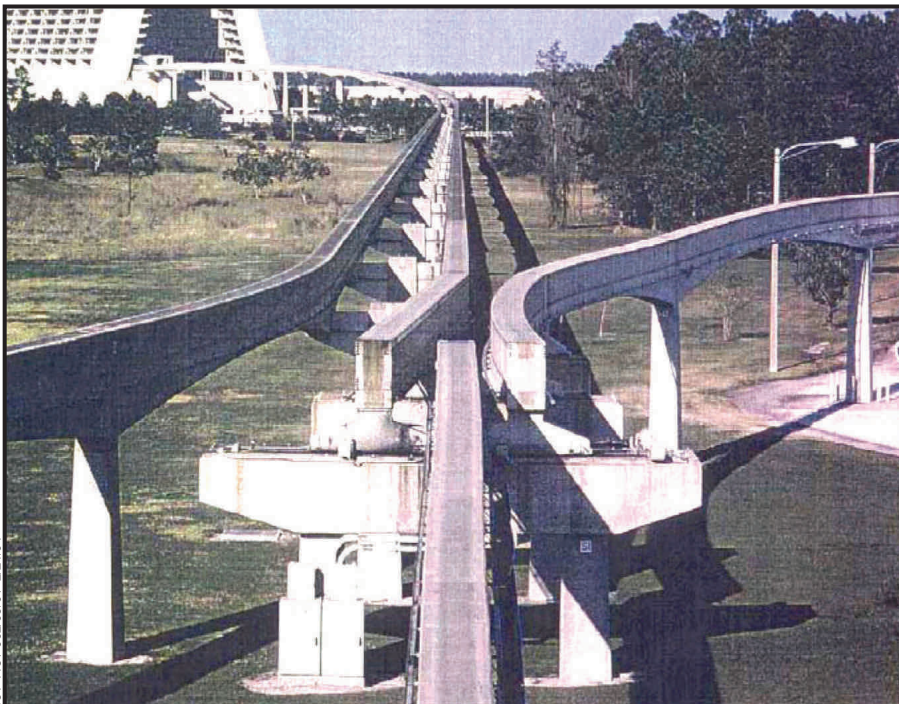
A terminus station is recommended to be located on the west side of California Avenue SW between SW Graham Street and Fauntleroy Way SW (Morgan Junction 1A (West)). This station location is recommended to allow convenient access for Metro buses and to avoid spanning the intersection. The single platform terminus station will complement the surrounding urban context. A switch will be located north of the station to allow trains access to a temporary storage track at the station.



Example of crossover switches (a pair of switches).



Another example of a switching structure.



Example of a single switch. An encasing structure could also be below the switches.

Note: Technology choices could affect appearance of the structure.

3.10 SUSTAINABILITY PROGRAM

One of the early resolutions of the SMP Board was focused on enhancing the environmental sustainability of the Green Line (Resolution 03-34, April 2, 2003). The Board directed “staff, contractors and the public to identify and implement creative ways to increase the project’s benefits to the quality of Seattle’s environment.” The SMP environmental sustainability program has involved early coordination with design and engineering leads for the Project, and extensive work with City Departments, outside experts and community resources to identify specific measures that go beyond environmental requirements or traditional mitigation. The sustainability program included a detailed design-focused workshop (co-sponsored by Seattle City Light). The program has led to identification of many environmental strategies and enhancements that will be required elements of the project (such as regenerative braking for the monorail trains). Other sustainability strategies will be part of the competitive process to select the contractor team that will design, build, operate and maintain the Green Line (the DBOM RFP). Under this RFP, the teams will be specifically required to propose creative solutions that enhance the inherent contribution of the project to the region’s sustainability. The solutions will be scored based on the potential contribution of each idea to reducing waste, pollution or energy consumption.

SMP recently received a letter underscoring the importance of the Project and the sustainability program from a wide spectrum of leading environmental groups (including 1000 Friends of Washington, Washington Conservation Voters, Transportation Choices Coalition, Sustainable Northwest, Climate Solutions, Cascade Bicycle Club and Bicycle Alliance of Washington). The groups stressed the inherent environmental benefits that will come from the Monorail, and stated that the Project “is becoming a symbol for how construction and transportation projects can be accomplished with the ultimate adherence to sustainability principles.” A copy of this letter is contained at Appendix DD, Public Involvement.

3.11 DELAYED IMPLEMENTATION

The benefits or disadvantages of reserving the implementation of the proposed project for some future time as compared with the possible approval at this time is discussed in this section. As mentioned in Section 3.6.11, SMP intends to begin operation of an initial Green Line segment on December 15, 2007, and start operation of the full system in 2009.

The primary benefit of delayed Green Line implementation would be the delay of impacts on transportation facilities, historic resources, and business/property displacements. These impacts would be delayed but not avoided.

Disadvantages from delayed implementation would include a delay in transit benefits described in Section 4.1.2.1 of this FEIS, increased project and right-of-way costs from delay, and increased uncertainty for property owners along the Green Line corridor whose property would be fully or partially acquired. The added transit service from the Green Line would also potentially not be available during construction of the Alaskan Way Viaduct improvements or the Link Light Rail Initial Segment. Implementation of an important element of the City of Seattle’s Intermediate Capacity Transit Study would also be delayed.

A number of commenters suggested building only a portion of the Green Line Project (e.g., stopping at each end of Downtown). As directed by the voters in Citizens’ Petition No. 1, SMP is required to build the Green Line consistent with the route described in the Seattle Popular Monorail Plan. Not building significant portions of the Green Line would be inconsistent with the Plan.

Delaying implementation of the Downtown portion of the Green Line until last was also suggested by some commenters. This suggestion would delay impacts of construction Downtown, but would increase Project costs to the public and lengthen the construction schedule. Construction would likely begin at or near the Operations Center site that is selected, because the Operations Center would need to be connected to any operating track portions so that trains could use those portions of the track. It would be more costly to the public to construct outlying portions of the Green Line that would then need to lie idle because they could not connect to the Operations Center for a long period of time.